WHO OFFSET PUBLICATION NO. 102

Innovative schools for health personnel

Report on ten schools belonging to the Network of Community-Oriented Educational Institutions for Health Sciences

R. Richards & T. Fülöp

in collaboration with

J. Bannerman, G. Greenholm, J.-J. Guilbert, & M. Wunderlich

World Health Organization
Geneva

01765

WHO offset publications are intended to make generally available material that for economic, technical, or other reasons cannot be included in WHO's regular publications programme and would otherwise receive only limited distribution. They are usually reproduced by photo-offset from typescript, rather than by letterpress, and do not necessarily receive such detailed editorial revision as other WHO publications.

COMMUNITY HEALTH CELL
Call No : MLE.10C
Acc No : 01765
Author : RICHARDS (R.) F.U.L.O.P.C.
...orative School Per...
...t Personnel
Date of return | Signature

Innovative schools for health personnel

Report on ten schools belonging to the Network of Community-Oriented Educational Institutions for Health Sciences

R. Richards & T. Fülöp

in collaboration with

J. Bannerman, G. Greenholm, J.-J. Guilbert, & M. Wunderlich

Center for Educational Development
University of Illinois
Chicago
IL, USA

Division of Health Manpower Development
World Health Organization
Geneva
Switzerland

World Health Organization
Geneva 1987

WHO Offset Publication No. 102

COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

01765
WH 100

ISBN 92 4 170102 1

© World Health Organization 1987

Publications of the World Health Organization enjoy copyright protection in accordance with the provisions of Protocol 2 of the Universal Copyright Convention. For rights of reproduction or translation of WHO publications, in part or *in toto*, application should be made to the Office of Publications, World Health Organization, Geneva, Switzerland. The World Health Organization welcomes such applications.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The authors alone are responsible for the views expressed in this publication.

ISSN 0303-7878

PRINTED IN SWITZERLAND

87/7338 – Schüler SA – 6000

CONTENTS

1. INTRODUCTION 1

Methods used in the study 2

2. THE CURRICULA 9

Community-related characteristics 11

Problem-based learning 18

Comments 26

3. PROGRESS OF THE SCHOOLS TOWARDS ACHIEVING THEIR GOALS 28

Outcomes studied and data used 28

Review of impact 29

Individual schools: outcomes and impact 43

4. SUMMARY AND COMMENTS 57

Comments on the curricula of the ten schools 57

Comments on the impact of the ten schools 62

Conclusions 64

Annex 1 Questionnaire 67

Annex 2 Specific findings for each outcome category 95

1. INTRODUCTION

In 1977, the World Health Assembly decided that the main social target of governments and of WHO should be the attainment by all the people of the world by the year 2000 of a level of health that would permit them to lead a socially and economically productive life. This concept is now popularly known as "health for all by the year 2000". In 1978, an International Conference on Primary Health Care, held in Alma-Ata, USSR, went a step further and stated that primary health care was the key to attaining this target. Primary health care represents a totally new approach to health development, in that it involves (*a*) a total reorientation of health services so that secondary and tertiary care are all geared to supporting the first-contact level of care, (*b*) a more equitable distribution of health resources, (*c*) a multisectoral approach, and (*d*) community participation.

Obviously if the goal set for the year 2000 is to be achieved, it will be necessary to plan, train and deploy health personnel, as an integral part of the health infrastructure, in sufficient numbers and of the required quality to meet the population's specific needs. However, to ensure the achievement of health for all, numerous and complex problems related to health manpower systems and to planning, training, deploying and utilizing health workers need to be solved. The Global Strategy for Health for All states that: "In many countries health personnel are not appropriately trained for the tasks they are expected to perform."[1] This underlines the fact that, in spite of the complexity of the problems mentioned, most of them derive from the irrelevance of the health manpower development process (planning, "production", management and utilization of personnel) to the needs of health systems development and, in the long run, to the health needs and demands of society as a whole.

Throughout the world there are now more and more health manpower development programmes in which the training stresses relevance to present and, it is hoped, future health needs. In 1979, nineteen of them, with WHO collaboration, formed the Network of Community-Oriented Educational Institutions for Health Sciences, which is now very actively working towards the achievement of its main objectives (*a*) to strengthen member institutions in achieving community orientation and problem-based learning, (*b*) to assist institutions in countries that have made a political decision to introduce innovations in the training of health personnel, with the ultimate goal of improving health care and contributing to the achievement of health for all by the year 2000. The Network comprises schools established at different

---

1 *Global Strategy for Health for All by the Year 2000.* Geneva, World Health Organization,1981, p.23 ("Health for All" Series, No.3).

times, one of them as early as 1965. WHO decided to launch, and collaborate in, a study of ten of these schools with the assistance of a WHO Collaborating Centre - the Center for Educational Development, University of Illinois at Chicago, USA. The general purpose of the study was to determine to what extent these schools had undertaken community-oriented and problem-based medical education, and to ascertain in what ways and to what degree the new approaches were affecting health care delivery, especially primary health care.

The ten selected schools were considered to give great emphasis in their training programmes to serving the needs of the people and to be using problem-based and/or community-oriented programmes of medical education as a means of ensuring relevance to health care needs. The study, therefore, sought answers to the following specific questions.

1. To what extent and in what ways are the ten study schools implementing community-oriented training programmes?

2. To what extent and in what ways are they implementing problem-based learning? To that extent is a problem-based approach contributing to the objective of community orientation?

3. What impact have these schools had on primary health care?

4. What impact have they had on the education of health professionals?

5. How do the characteristics of the graduates compare with those of the graduates of more conventional schools and reflect the innovative characteristics of the institutions themselves?

The study had other purposes as well. To the authors' knowledge such a comprehensive cross-institutional examination of educational reform in medical schools had never before been undertaken. The aim of the study, therefore, was to learn more about successful and unsuccessful methods of curriculum development and the types of leadership that were responsible for establishing something significantly different and ensuring that it survived. The findings on these latter questions will be reported elsewhere.

Methods used in the study

Information was obtained from a sample of medical education programmes provided by schools belonging to the Network. A questionnaire was sent to those

connected with one group of programmes, while those responsible for a second group were not only sent the same questionnaire but also received a visit from one of the persons conducting the study. This report deals only with the second group.

Selecting the sample

The schools selected for visits were all relatively new and had been established in the late 1960s or more recently. All were known to have intended to include at least some elements of problem-based learning and/or community-oriented instruction in their curricula. The majority of the programmes had been described previously[1]. At least one school was selected from each of the six WHO regions, to help obtain a global perspective on the issues involved. It was a condition that at least two groups should have graduated from each of the schools selected, although it was found during the study that one school had had only one group of graduates as of 1985. At the time of the study a total of nearly 2600 students had graduated from the ten schools. A brief description of each programme is provided below.

Medical Faculty
RijksuniversiteitLimburg
Maastricht, The Netherlands

Maastricht's medical faculty was the first unit of a new university established in 1974 with the purpose of providing medical education oriented towards the primary health care needs of the Limburg region. The programme lasts six years and by the summer of 1985 six classes (some 175 students) had graduated. The first four years of the curriculum are strongly problem-based and small-group tutorials are used as one of the main methods of instruction.

Faculty of Health Sciences
Ben Gurion University of the Negev
Beersheva, Israel

The medical school at Ben Gurion University of the Negev (BGU), established in 1974 as the first component of a university centre for health sciences, was founded to meet the specific health needs of the Negev. The programme lasts six years and five classes (about 176 students) have graduated. The programme is unusual in that

---

1 Katz, F. M. & Fülöp, T. *Personnel for health care: case studies of educational programmes.* Vol. 1 and 2, Geneva, World Health Organization, 1978 and 1979 (Public Health Papers No. 70 and 71).

a single administrative structure is responsible for both educational activities and health care delivery in the region.

Centre Universitaire des Sciences de la Santé
University of Yaoundé
Yaoundé, Cameroon

Yaoundé's medical school (CUSS), Cameroon's first medical school, was founded in 1968 to serve the specific health care needs of that country. The programme lasts six years and ten classes (approximately 400 students) had graduated at the time of the study. The original goals of the school emphasized the importance of a team approach to primary care delivery, health education and prevention. Research is now also emphasized (CUSS has been designated a World Health Organization Collaborating Centre for Research and Training in Immunology).

Institute of Medicine
Tribhuvan University
Kathmandu, Nepal

The Institute of Medicine (IOM) at Kathmandu was established in 1972 to educate health professionals to meet the health care needs of Nepal. Although the first medical students began training under the programme in 1978, by 1984, owing to political and logistic problems, only one class (12 students) had graduated. The IOM trains other types of health professional also. Half the medical students are covered by a career system under which they begin training under the medical programme proper only after being trained as lower-level health professionals and having served as such.

Institute of Health Sciences
Tacloban, Philippines

The Institute of Health Sciences (IHS) was established in 1976 by the University of the Philippines College of Medicine in order to train health professionals for the underserved regions of the country, particularly Leyte, where it is located. The medical portion of the curriculum lasts five years and the first class of 12 physicians graduated in 1985. The school operates a full ladder curriculum under which each student must qualify at each of four lower health-professional levels and actually serve at those levels before being admitted to the medical programme proper. The entire curriculum lasts about 9 years in all.

Faculty of Medicine
University of Newcastle
Newcastle, New South Wales, Australia

The UNC Faculty of Medicine was established in 1975 to meet the health care nees of the medically underserved Hunter Region. The first group of students entered in 1978. By 1985 two classes (about 100 students) had graduated. The 5-year curriculum lays emphasis on problem solving and population medicine.

Universidad Autonoma Metropolitana Xochimilco
Mexico City, Mexico

The UAM Xochimilco campus, one of the University's three constituent campuses, was established in 1974 and given responsibility for the health care of about two million people in the southern part of Mexico City. The programme lasts five years and by 1984 six classes (587 students) had graduated. The curriculum emphasizes interdisciplinary approaches, learning by problem-solving, and relevance to Mexican social conditions.

M.D. Program
Faculty of Health Sciences
McMaster University
Hamilton, Ontario, Canada

The Faculty of Health Sciences at the old-established McMaster University was set up in 1965 with a view to enabling medical students to learn how to become effective problem-solvers. The first students under the 3-year programme entered in 1969. By 1984 thirteen classes (1070 students) had graduated. The McMaster University programme serves as a model to the rest of the world on the problem-solving approach to medical education.

Upper Peninsula Medical Education Program
College of Human Medicine
Michigan State University
East Lansing, Eseanaba and Marquette
Michigan, United States of America

The Upper Peninsula Program (UPMEP) was established in 1974 as an alternative course in an existing medical school with a view to producing physicians willing and able to work in the medically underserved areas of Michigan. The programme lasts four years, the last two years being spent at a remote rural site, and six classes (37 physicians) had graduated at the time of the study. The first two years of the programme lay great emphasis on problem-solving.

Primary Care Curriculum
College of Medicine

University of New Mexico
Albuquerque, New Mexico, United States of America

The Primary Care Curriculum (PCC) was established in 1979 as an alternative track in an existing medical school with a view to training physicians to serve the population of New Mexico, and particularly the medically underserved rural areas. It constitutes the first two years of a four-year medical curriculum and in 1984 and 1985 a total of 25 students graduated before rejoining the students in the original track for their clinical training. The PCC lays great emphasis on problem-solving.

Data collection

A letter inviting the ten schools to participate in the study was sent to their respective deans. The study was described and the methods to be used indicated. Each dean was requested to arrange for the enclosed questionnaire (Annex 1) to be completed and for supporting documentation to be collected. The questionnaire asked for information related to goals, curriculum, outcomes, organizational system, evaluation systems (for students and the programme) and external factors of importance.

The schools were urged to forward the completed questionnaires and documentation, if their schedules permitted, to Chicago in time to be reviewed by the site visitor before his visit. The schools were given an honorarium of US$ 200 each towards meeting the costs involved in providing the information and documentation requested.

Site visits

All the schools were visited by Dr Richards, except for the Universidad Autonoma Metropolitana Xochimilco in Mexico, the Upper Peninsula Program in the United States of America, and McMaster University in Canada. The Mexican programme was visited by Dr J.-J. Guilbert of WHO headquarters, Geneva, and the other two by Dr G. G. Greenholm of the Center for Educational Development (CED), University of Illinois, Chicago, USA.

The length of the visits ranged from three to five days; they consisted primarily of interviews with people both in and outside the programme, aimed at obtaining further data, validating the information entered in the questionnaire and gaining an impression of the context in which the innovative programme had been implemented. The average length of an interview was about an hour although in one instance a person who was very familiar with a programme was interviewed for a total of over

twenty hours. The site visitor took notes at each interview; in addition, at some sites, interviews were recorded for later transcription. The site visitor also in most cases obtained additional documentation to supplement the material the schools had provided beforehand.

At the interviews the six subject areas covered by the questionnaire were explored, and in addition the patterns of leadership in the programme were discussed. Information was obtained through questioning, observation and documentation on the processes, content and context of each programme. Interviewers had been given a list of suggested questions in each subject area, to be adapted to the circumstances at each site.

At each school, the dean (or equivalent) or his or her designate was asked to select persons to be interviewed; usually during the visit itself the site visitor picked out further people for interview. Each school received guidelines for arranging the site visit (Annex 1).

The schools were very helpful in making arrangements for the interviews, providing access to documentation and generally facilitating the visits. In most instances, interviews were held with people in all of the roles indicated in the site visit guidelines; usually others with knowledge of the programme were also interviewed. Ten to twenty interviews were conducted at each site.

Analysis

Reports were prepared on each of the schools visited, based on all the available sources of data - questionnaire, interviews, site visit summaries and documentation.

For the reports the following general outline was used:

I. Background information on the school

II. Description of the programme

III. Curriculum: problem-based learning

IV. Curriculum: community-based education

V. Evaluation systems

VI. Organizational structure

VII. Leadership

VIII.Outcomes

IX. Conclusions

When gaps were found in the available data and/or when substantial difficulties of interpretation were encountered, specific follow-up questions were addressed to the dean of the school.

On completion of a draft report, it was reviewed by those conducting the study primarily to discover whether any data were missing or ambiguous. The revised draft report was then sent to the school's representatives so that they could correct any remaining factual errors and comment on any interpretations and evaluations contained in the draft. On the basis of the reports, a preliminary descriptive summary covering all the schools was prepared. The anonymity of the schools was maintained by designating the schools as A, B, C, and so forth to J. These letters are used for the same schools throughout the report.

Once the reports had been completed, the degree to which various aspects of community-orientation and problem-solving had been successfully introduced was measured on the basis of the data collected and the facts described therein. The schools were then given a ranking (high, medium, or low) for each aspect. Wherever possible, the ranking was based on comparable quantitative data taken direct from the schools' responses to the questionnaire. In other cases the researchers who had written reports on the schools were asked to rank each school they had analysed as high, medium, or low on a continuous scale according to the degree of community orientation and use of problem-solving approaches displayed in its various activities. Additional school documents were examined to cross-check the rankings given to the ten schools by the various assessors. The dividing lines between the categories high, medium, and low are somewhat arbitrary in some cases, but the starting point was always the "traditional" approach to the factor concerned, classified in every case as "low". The rankings were reviewed by the researchers as a group in order to ensure consistency in the treatment of the various schools. Section 2 of this book deals with the nature and extent of community-oriented and problem-based approaches found at the schools. Section 3 summarizes the findings in regard to the impact of the schools on health care, the education of health personnel, and the characteristics of the graduates produced, both overall and school by school. Section 4 contains conclusions and recommendations emanating from the study.

2. THE CURRICULA

Terminology sometimes leads to confusion rather than clarity. This appears to be the case with the terms "community-oriented education", "community-based education", and "problem-based learning". In 1979, at the founding meeting of the Network of Community-Oriented Educational Institutions for Health Sciences, community-oriented education was defined as that "... focused on population groups and individual persons which takes into account the health needs of the community concerned."

The terms community-based education and problem-based learning are usually understood to mean two strategies for facilitating community-orientation. A programme or curriculum is considered community-based "if it consists of an appropriate number of learning activities in a balanced variety of educational settings, i.e., in both the community and a diversity of health care services at all levels, including the tertiary care hospitals."[1] Community-based education is based, in part, on the belief that it is necessary to bring those studying for health professions into direct contact with the community environment in order to train them appropriately to practise in the community after graduation.

Problem-based learning, on the other hand, is defined by Barrows & Tamblyn (1980)[2] as "learning that results from the process of working toward the understanding or resolution of a problem" (p. 1). "This method of learning has two educational objectives: the acquisition of an integrated body of knowledge related to the problem, and the development or application of problem solving" (Barrows & Tamblyn, p. 12).

---

1 WHO Technical Report Series, No. 746, 1987 (*Community-based education of health personnel:* report of a WHO Study Group), p. 9.

2 Barrows, H. S. & Tamblyn, R. M. *Problem-based learning: an approach to medical education.* New York, Springer Publishing Company, 1980.

Barrows has since added a third objective, the learning of clinical reasoning skills, to this method.[1] In problem-based learning, the student encounters the problem in its natural context (or a close approximation thereto) before undergoing any instruction on the topic concerned. The student must determine (with the help of the tutor and other students) how to obtain the necessary information and how to apply it to solving the problem. The students therefore learn to look for cues in the context of the problem to guide their actions. The problems may be real problems encountered by the student in the community setting, problems taken from the community setting and re-enacted for the student, or problems simulated by teaching staff on the basis of general assumptions as to what a student is expected to encounter in actual practice. Although this type of problem-solving exercise is used by community-oriented schools, it is by no means limited to them. To some degree it has, in fact, been used for decades in traditional tertiary-care clinical training.

It is often argued in discussions on health manpower development that community-oriented medical school curricula are by definition more relevant to a society's health care needs. It is also frequently asserted that the use of problem-based learning as an approach to the education of health personnel increases the degree to which that education contributes to meeting health needs. The aim of this study was to determine the nature and extent of community-oriented and problem-based learning in the ten schools and to seek out whatever evidence might be available on their impact on health services. This section is concerned with three questions:

1. To what extent and in what ways are the ten study schools using community-oriented approaches?

2. To what extent and in what ways are they applying problem-based learning?

3. To what extent does the use of problem-based learning help to attain the objective of community orientation?

It was decided not to judge the ten schools against some pre-established standard, but to discover and describe to what extent and in what ways they were community-oriented in their educational approach, particular attention being given to community-based and problem-based education. The findings are reported below, for community-oriented education first and then for problem-based education.

---

1 Barrows, H.S. A specific problem-based, self-directed learning method designed to teach medical problem-solving skills and enhance knowledge retention and recall. In: Schmidt, H.G. & de Volder, M.L. ed., *Tutorials in problem-based learning,* Assem/Maastricht, Van Gorcum, 1984

Community-related characteristics

It was found that the extent and type of community orientation used in practice by the ten schools could be effectively described by considering five characteristic aspects: the principles underlying the school's activities, the main emphasis in the curriculum, the part in the curriculum by learning from experience, the extent of community involvement, and the organizational linkages between the educational and health care delivery systems.

The extent to which a school's underlying principles are community-oriented

Although most medical schools offer some learning experience in their curricula that could be considered community-oriented, it may or may not be supported by underlying community-oriented principles. Thus, in those cases where the innovative programme was a relatively small part of a more traditional medical school, the study examined the community-orientation of the medical school as a whole. In cases where the innovative programme was applied by an entire medical school in a university setting, the orientation of the larger entity was investigated to determine whether the goals, either within the programme or within the larger entity, were supportive of or antagonistic to a community orientation.

Nine of the ten schools are institutions (or form part of institutions) whose goals are consistent with a community-oriented philosophy. They aim to produce health professionals especially adapted to community practice, community needs and community interests. In four of them the community-oriented approach is fully consistent with the primary purposes of the institution itself. In the tenth case, in which the community-oriented programme is conducted within a more traditional school, the institution as a whole is based on principles that are neither particularly supportive of nor antagonistic to the community-oriented programme itself.

Emphasis in the curriculum on concepts and knowledge of community, populations, health needs, and cultural and social contexts

Community-oriented learning is concerned with both concepts and skills. The extent to which the various programmes provide for the learning of concepts relating

to such subjects as community organization, population needs, epidemiological analysis and health education, as well as for the development of immediate "on-site" problem-solving skills, was examined. Respondents to the questionnaire were asked to indicate in which years of their particular curriculum these specific concepts are taught.

It was found that community concepts were an integral part of the curricula in all ten schools. Table 1 illustrates some of the subjects covered. On the whole, there is a heavy emphasis on the health problems and major diseases of the country concerned, epidemiology, maternal and child health and family planning. When the number of subjects covered and the frequency with which they occurred in the curriculum were considered together, six schools were found to rank particularly high.[1] The remaining four schools were classed as medium in these respects. In addition to the above items, water-borne diseases and lack of safe drinking-water are serious health problems in the regions served by four schools. All four schools reported that their curricula deal with these matters in at least one year.

Learning through experience, including community-based learning

All medical education devotes a significant percentage of time to learning through experience in various settings related to health care. In most cases, emphasis is laid, sometimes exclusively, on experience in tertiary-care hospitals in large cities. A community-oriented medical school, however, could reasonably be expected to give an opportunity to students to do a significant amount of their learning from experience in the community rather than in a large hospital. This might include working in community health facilities, making home visits, working as or with health workers in underserved areas (urban slums, remote villages), undertaking community health projects (nutrition, sanitation, etc.), establishing a diagnosis of community health and determining how to deal with the problems found by accompanying community health leaders in their visits, etc. It would seem that students more easily acquire the values, perspectives and skills needed to work in the community when ample time is allowed for such activities and when they form part of every year of the curriculum. This study ascertained (from the responses to the questionnaire and from documents on the curriculum) the amount of time that students

---

1 See page 8 for an explanation of how the rankings were arrived at.

Table 1. Community-oriented concepts in the schools' curricula: years in which the subjects are covered[a]

Community-oriented concepts	School[b]									
	A(6)	B(5)	C(4)	D(3)	E(4)	F(6)	G(5)	H(5)	I(4)	J(6)
Major health problems of country	1, 2, 4, 6	3[c]	1, 2, 3, 4	1, 2, 3	1	1, 3, 4, 5, 6	1, 2, 3, 4, 5	1, 2, 3, 4, 5	1, 2	1
Major diseases of country	1, 2, 3, 4, 5, 6	3[c]	1, 2, 3, 4	1, 2, 3	1, 2, 3, 4	1, 3, 4, 5, 6	2, 3, 4, 5	1, 2, 3, 4, 5	1, 2	3, 4, 5
Major diseases not common in country	0	[c]	0	0	2, 3, 4	3, 4, 5, 6	4	0	0	3, 4, 5
Epidemiology	1, 2, 4	[c]	1, 2, 3, 4	1, 2, 3	2	1, 2, 3, 4	2, 3, 4, 5	1, 2, 3, 4, 5	1, 2	1, 2, 3, 4, 5, 6
Provision of health education	3, 6	[c]	1, 4	1, 2, 3	2	0	5	1, 3, 5	0	1, 2, 3, 4, 5, 6
Food and nutrition	2, 3	[c]	1, 4	1, 2	2, 3, 4	2, 3, 6	1, 3	0	2	2, 3
Safe water supply	0	[c]	1	0	0	0	5	0	0	1, 2, 3
Water-borne diseases	0	[c]	1	2	–	–	–	–	–	–
Sanitation	0	[c]	1, 4	0	0	1, 2, 3, 4, 5, 6	5	0	0	1, 2, 3
Maternal and child health	1, 2, 4, 6	[c]	1, 2, 3, 4	2, 3	2, 3, 4	2, 4, 6	3, 5	4	3	1, 2, 3, 4, 5, 6
Family planning	1, 3, 6	[c]	1, 2, 3, 4	2, 3	2, 3, 4	2, 3, 4, 5, 6	3, 5	4	1, 3	4, 5, 6
Immunization	2, 6	[c]	1, 3, 4	1	2, 3, 4	2, 6	1, 3, 5	4	3	1, 3, 4, 5
Prevention of endemic diseases	0	[c]	1, 2, 3, 4	1, 2, 3	2, 3, 4	1	2, 3, 5	1, 2, 3, 4, 5	0	1, 2, 3, 4, 5, 6

[a] This table refers to the portions of the curricula covering medical education.
[b] Figures in brackets give total number of years in medical curriculum.
[c] All the community-oriented concepts listed are covered in the premedical curriculum with follow up in later years.

Table 2. Community activities in the schools' curricula: years in which the activities occur[a]

Community activity	School[b]									
	A(6)	B(5)	C(4)	D(3)	E(4)	F(6)	G(5)	H(5)	I(4)	J(6)
Making home visits	1, 2, 3, 4, 6	2, 4	1	3	1, 3	1, 2, 3, 4, 5	2, 3, 4, 5	2, 4	1	3, 4, 5
Meeting community leaders	1, 2, 3	2, 4	1, 2, 3, 4	3	3	once	5	1, 3, 4	1	3, 4, 5, 6
Conducting epidemiological studies	2, ,4 6	2, 4	3, 4	3	3	1, 4, 5, 6	2, 3, 4	1, 2, 3, 4, 5	1	2, 3, 4, 5, 6
Visiting rural families	1, 2, 4, 6	2, 4	1, 2, 4	occas-ionally	3, 4	1, 2, 5, 6	5	3	1	3, 4, 5, 6
Visting urban families	1, 2, 4	0	1, 3, 4	3	4	1, 2, 5, 6	3, 4	1, 2, 4	0	0
Working in health clinics	1, 2, 4, 6	2, 4	1	3	3	1, 2, 3, 4, 5, 6	3 ,4	0	1	3, 4, 5, 6

[a] This table refers to the portions of the curricula covering medical education.
[b] Figures in brackets give total number of years in medical curriculum.

spend in community-based learning and the extent to which such learning is spread throughout the curriculum of each school.

The ten schools provide an extensive range of community activities for the students. Table 2 shows what each school offers and in what year or years. All the schools provide for making home visits, meeting community leaders, conducting epidemiological studies and visiting rural families. Nine of the ten schools allot time for students to work in health clinics. Seven of them provide for visits to urban families. The number of years in which these activities appear in the curriculum varies from one year to all years.

It was also found that students assume varying levels of responsibility for their community assignments. They may provide health care or health-related services, observe practitioners, work with community members or undertake community development projects. In four schools, students are responsible for providing valuable health services at their point of work in the community. For example, in two schools the student must serve as a health worker before beginning or continuing studies. Students are sent to villages to tackle a specific health-related problem, such as one related to fresh water supply, the provision of basic medical services, or health education. In other programmes, the students' primary responsibility in their community work is to observe and to learn, although they do take patient histories and perform physical examinations and may participate in patient management.

Four of the ten schools studied have some type of community-based activity in every year of their curricula. Four others have community-based activities in every year but one. In two schools, community-based activities occur in only one year.

When the types of community-based activities *and* the number of years in which they form part of the curriculum are both taken into consideration, five schools rank high, two medium and three low.

Community involvement in the educational programme

Some form of community involvement is found in all ten schools studied, but differs in degree. In seven of the schools, community involvement is relatively passive, the community merely offering practice sites for students and in many instances providing health practitioners to act as teachers or tutors. These schools are ranked "medium" so far as community involvement is concerned. The other three schools, ranked high in that respect, ask the communities to play a more active role. In the case of one of these schools, for example, the various villages in the region ac-

tually select the students that attend the programme. In another, a community committee participates in the funding of the programme as well as in the admissions process.

Organizational linkage with the health services system

The ten schools differ in their arrangements for clinical training. Four of them operate hospitals or hospitals and clinics; two operate clinics only. The remaining four utilize hospitals and clinics in the area for student training and the provision of services by the teaching staff. Organizational linkages between the educational programmes and the health care services also differ between schools. In the two schools with the closest linkages, the director of the educational programme (the dean) is also the director of the regional health services. In one case, the school is responsible for nearly all the health care in the region; in the other, the government health service system is responsible for the educational programme.

Two of the remaining eight schools have built up a moderate degree of linkage between the educational and service sectors. They have formal agreements on functional cooperation and coordinating mechanisms to ensure that students are properly trained for the health services and that the health services are able to provide them with appropriate work when they graduate. In the six remaining schools, teaching staff (and sometimes students) provide health care, but without formal organizational relationships between the school and the health service system. One of the six has plans for such a relationship; another has a relationship only on paper, not in practice.

To sum up, the schools as a group emphasize community concepts in their curricula and have strong institutional support for that emphasis. In addition, there is considerable involvement of communities in the planning and implementation of the schools' activities. The extent of community-based experience for students and the degree of linkage between the educational and service sectors however differ considerably between different schools (see Table 3).

Table 3. Degree of community orientation in the schools

Community-oriented characteristic	School									
	A	B	C	D	E	F	G	H	I	J
Broad institutional principles supportive of community orientation	high	high	high	medium	medium	medium	high	medium	low	medium
Emphasis in the curriculum on conceptual aspects of community orientation	high	high	high	medium	medium	medium	high	high	medium	high
Type, duration and frequency of community-based experiences	high	high	high	low	low	medium	high	medium	low	high
Community involvement in programme planning and implementation	low	high	low	low	medium	low	medium	low	low	low
Educational programme's linkages with health services systems	high	high	medium	low	medium	low	low	medium	low	medium

Problem-based learning

In addition to assessing various aspects of community orientation in the ten schools, the study examined the ways in which problem-based learning was incorporated in their programmes. Information was sought on the extent to which the problems used served as a basic element in putting the curriculum together, the degree to which the students played an active role in the learning process, whether small-group tutorials or group discussions were used as a major form of instruction, especially in the early years, and finally, how far the curriculum stressed the process of problem-solving rather than the mere acquisition of a basic body of scientific and clinical knowledge.

The use of problems as the basic element in organizing the content of the curriculum

In most cases, the courses a medical student takes are organized by discipline (e.g., biochemistry, anatomy, paediatrics, surgery etc.). An alternative is to divide up the subject matter on the basis of organ systems. When this is done, appropriate information from each of the disciplines is organized around a body system, such as the cardiovascular or nervous system. A third way to organize a curriculum is to focus on "problems". In a problem-based curriculum, the knowledge and skills to be acquired are grouped around problems, such as chest pain, fever, malnutrition, etc. Problems (or case studies) are also used for other purposes in education - as illustrative examples, for instance, as student exercises or for evaluation. Table 4 illustrates the ways in which the ten schools utilize problems.

Five schools indicated that problems served as a basis for the acquisition of an integrated body of knowledge. These five are rated high in this respect. The remaining five schools, which do not use problems to organize their curricula, are rated low. Problems serve additional functions, however, in both groups. Seven of the schools use problems mainly in training students to gather and organize patient data. In four, students are given problems to which they must apply previously learned knowledge and skills. Two schools use problems primarily to illustrate lectures.

Table 4. Problem-solving approaches used in the schools' curricula

Problem-solving approach	School[a]									
	A	B	C	D	E	F	G	H	I	J
Lecturers use problems to illustrate the application of what they teach	PC	PC C	PC[b] C[b]	Not used	PC	PC C	PC C	Not used	C	PC[b] C
Students learn to gather and organize patient data using a problem-solving approach	PC C[b]	PC C	PC C	PC[b] C	PC	PC C[b]	PC[b] C[b]	Through-out[b]	PC C[b]	C[b]
Students are presented with problems to which they apply information learned in other ways	PC[b]	PC[b]	PC C[b]	PC C[b]	PC	PC C	PC	Not used	PC C	Not used
Students do problem-solving exercises outside class	PC C	Not used	Not used	Not used	PC	Not used	PC C	Not used	PC (available)	Not used
Problems serve as the basis for the acquisition of an integrated body of knowledge and determine the amount of factual knowledge learned	Not used	Not used	Not used	PC C	PC[b]	PC[b] C	Not used	Through-out	PC[b] C	Not used

[a] PC – approach used in pre-clinical curriculum; C – approach used in clinical curriculum.
[b] Best describes the problem-based approach in the curriculum.

The degree to which students participate actively in the learning process

One of the advantages claimed for problem-based learning is that it allows students to find out things for themselves and in situations similar to those they will face as graduates. Active student participation in the educational process may be the means of making that process more relevant to future practice. Such participation is better encouraged by the teaching staff offering unobtrusive guidance rather than leadership and by helping the students to find out things for themselves rather than providing them with information through lectures. The ten schools were reviewed in terms of the roles ascribed to students. A number of criteria were used to assess the degree of student participation, including the extent of reliance on lectures (a very passive student activity), the amount of self-directed learning and of acquisition of knowledge through problem-solving, and the use of tutorials.

While in all ten schools there is some degree of active student participation, the extent to which they subscribe to the principle varies considerably. In five of the schools the students play a very active role. These programmes use few, if any, lectures, depend upon small-group tutorials in the early years, and incorporate self-directed learning. One school, on the other hand, relies heavily on lectures and its students play a passive role, problems being used to illustrate lectures and as a means of helping students to organize information they have learnt through more passive methods. In the remaining four schools, however, the students play a moderately active role, in that while teachers sometimes control the educational activities, they also sometimes merely facilitate the learning process.

Small-group instruction as an educational method

Some experts consider that problem-based learning requires heavy use of small-group learning. They argue that active student learning is easier in individual or small-group settings. An attempt was made in the study to ascertain the degree to which the schools used small groups as the setting for problem-based learning.

Table 5 summarizes the data received from the ten schools on the various modes of instruction used in their programmes. Most schools use lectures at some time. In three schools, lectures are one of the principal methods of teaching, while two others reported that they never used lectures as a mode of teaching. All schools, however, use small-group discussions, and all except one use small-group tutorials.

Table 5. Modes of instruction in the schools' curricula: years in which each is used[a]

Mode of instruction	School[b]									
	A(6)	B(5)	C(4)	D(3)	E(4)	F(6)	G(5)	H(5)	I(4)	J(6)
Lecture	P: 2, 3 S: 1	S: 1, 2, 3	P: 1, 2	S: 1, 2	S: 1, 2	S: 1, 2, 3, 4, 5, 6	S: 3, 4	Not used	Not used	P: 1, 2, 3, 4, 5 S: 6
Small-group discussion	S: 1, 2, 4, 5, 6	S: 1, 2, 3, 4	S: 1	P: 3	P: 1, 2, 3, 4	S: 1, 2, 3, 4, 5, 6	P: 1, 2, 3 S: 4, 5	P: 1, 2, 3 S: 5	P: 3, 4	P: 4, 5, 6 S: 1, 2, 3
Small-group tutorial	S: 1, 2	Not used	P: 3, 4 S: 1	P: 1, 2	Not used	P: 1, 2, 3, 4 S: 5, 6	P: 1, 2, 3, 4 S: 5	P: 4	P: 1, 2	S: 1, 2
Laboratory group	S: 1, 2	Not used	P: 3, 4 S: 1, 2	Not used	S: 1, 2	P: 1, 2, 3, 4 S: 5, 6	S: 1, 2, 3	Not used	S: 1, 2	P: 1, 2, 3 S: 4, 5, 6
Field work	S: 1, 2, 3, 4, 5, 6	P: 1, 2, 3, 4	P: 1	Not used	Not used	S: 1, 2, 3, 4 P: 5, 6	S: 1, 2, 4 P: 3, 5	Not used	S: 1	P: 4, 5, 6 S: 2, 3
Self-directed learning	Not used	Not used	Not used	P: 1, 2, 3	S: 1, 2	P: 1, 2, 3, 4 S: 5, 6	Not used	S: 1, 2, 3, 4 P: 5	S: 1, 2	P: 6 S: 4, 5
Other	(Clinical) P: 4, 5, 6 S: 1, 2 (Field projects) S: 1, 2, 4, 6		Not used	(Clinical) Placement P: 3	(Preceptorships) P: 3, 4					(Speciality small groups) P: 6

[a] P = primary use; S = secondary use.
[b] Figures in brackets give total number of years in the medical curriculum.

How those completing the questionnaire differentiated between tutorials and discussion groups is not clear, so that for the purposes of analysis the terms should probably be treated as synonymous, except when explicitly defined by additional documentation. When all years of each of the curricula are compared, six of the schools rank high in respect of small-group instruction, two rank as medium and two rank low.

Emphasis on the learning process rather than on content

In some cases, the problem-based approach has developed over the last two decades as a response to the "explosion" in knowledge. Some schools have concluded that biomedical knowledge is now so extensive and is changing so rapidly that it is unreasonable, if not impossible, to expect a medical student to master it in its entirety. Furthermore, they believe - although this is not always explicitly stated - that it is impossible to define a smaller, more manageable, core of "essential" knowledge because physicians who use different bodies of basic information and knowledge may perform equally well as practitioners. These schools argue that the curriculum must therefore be process-oriented, i.e., should aim at enabling students to learn principles of self-teaching and problem-solving that can be applied anywhere in practice. In schools where problem-based learning is the norm, the emphasis is thus on learning how to solve problems rather than merely learning a predetermined set of scientific facts. A purely problem-based school would therefore not lay down a specific content for its curriculum, but rather select appropriate individual (clinical) and community problems for the students to solve; what was learnt would thus depend on the individual student's approach to solving the problems set.

Five of the ten schools indicated in their responses to the questionnaire and in supporting documentation that they did not believe it possible to define a body of knowledge that all medical students must learn and that consequently, they had not set specific objectives in regard to precisely what their students should learn. Instead, they relied on selecting appropriate problems for the students to solve to determine the nature and extent of the knowledge acquired by each individual student in the process of problem-solving. These five schools were rated high for the degree to which they emphasized the process of learning rather than the acquisition of specific knowledge.

In one programme an unsuccessful attempt was made to determine the knowledge that students needed to acquire on the basis of their statements regarding what they already knew. The curriculum developers in this case then chose instead to focus on the creation of alternative clinical settings for student instruction. Because this

procedure puts more emphasis on alternative experiences than on specific content, this school was given a medium rating.

The remaining four schools all indicated their belief in a finite and definable body of knowledge which all medical students needed to learn; two of them had consequently developed lists of specific content objectives for their students.

It is noteworthy that five of the ten schools ranked high on all four of the problem-based criteria (see Table 6). In this group of schools, the content of the curriculum depends largely on the types of problems presented to the students. In the study an attempt was made to determine the extent to which these schools used the problem-based approach to enhance their community orientation, that is, the extent to which community health needs served as a criterion for problem selection.

The problem-based group reported that they used a combination of the following criteria in selecting problems for their students: (1) how often the problem is seen by practitioners (4 schools); (2) the extent to which the problem serves as a vehicle for the application of knowledge (3 schools); (3) the seriousness (threat to life) of the problem (2 schools); and (4) its treatability (2 schools) (see Table 7). Except insofar as problems frequently seen by physicians may be high-priority health problems, the problem-based schools tended not to emphasize the health needs of the community.

The basis for curricular decisions

Analysis of the ways in which problems are selected and the realization that problem-solving varies in importance in different curricula led to an attempt to ascertain the basis on which curricular decisions are made, or have been made, in the ten schools concerned. Curriculum documents and stated objectives were compared for all the schools. Three possible principles underlying the development of curricula were singled out. They are:

(1) a primary concern with imparting knowledge that is essential for a physician if the or she is to be competent;

(2) a primary concern with determining what makes a physician competent and a more flexible attitude regarding the body of knowledge on which that competence depends; or

(3) a primary concern with competence, as in (2), but with competence specifically to deal with community health needs.

Table 6. Rating of schools according to their use of a problem-based approach

Problem-based characteristic	School									
	A	B	C	D	E	F	G	H	I	J
Problems used to organize the curriculum	low	low	low	high	high	high	low	high	high	low
Students play an active part	medium	medium	medium	high	high	high	medium	high	high	low
Emphasis on small-group instruction	medium	low	medium	high	high	high	high	high	high	low
Learning process emphasized more than content	low	medium	low	high	high	high	low	high	high	low

Table 7. Criteria for selection of problems in five problem-based schools

Criteria	School				
	D	E	F	H	I
Frequency of occurrence	x		x	x	x
Vehicle for application of knowledge	x	x			x
Seriousness	x			x	
Treatability or preventability	x			x	
Other	x				x

Table 8. Goals used as a basis for decisions regarding the curriculum

Goals	School									
	A	B	C	D	E	F	G	H	I	J
To teach the knowledge that a physician has to have			x		x	x	x		x	x
To produce competent physicians	x	x	x	x	x	x	x	x	x	x
To produce physicians competent to meet community health needs	x	x	x							

(3) a primary concern with competence, as in (2), but with competence specifically to deal with community health needs.

Although by definition both the community-oriented and the problem-based systems eschew the traditional knowledge base, six of the schools appear to emphasize, at least in part, the acquisition of a defined body of knowledge (see Table 8). All ten schools, on the other hand, appear to be competence-based. Although this may seem inconsistent for the six schools concentrating on a defined body of knowledge, it was found in the study that in many cases the students completing an innovative programme must also be able to meet traditional governmental or professional requirements in respect of acquired knowledge. For example, in four of the schools the graduates must pass a regional or national licensure examination before being allowed to practise. In effect, they must satisfy the competence requirements of the educational programme and also the requirements of the region or country in respect of acquired knowledge. A particularly noteworthy point, however, is that only three of the schools were found to base their assessment of competence to any significant extent on ability to satisfy community health needs.

Comments

At different times, in different ways and to varying degrees, each of the ten schools whose programmes were studied had come to the conclusion that traditional medical education was not appropriately oriented towards the health needs of the country and/or the region the school served. They were therefore seeking in one way or another to make students' experience during their training more relevant to their future practice.

The study found that the ten schools could be divided into two distinct groups on the basis of their approaches to developing an educational programme that would be more relevant to community health needs: a group of five community-oriented schools and a group of five problem-based schools. The community-oriented group of schools, located in developing areas, had realized that traditional medical education does not teach students what they need to know in order to serve community health needs competently. They had therefore broken away from the traditional concentration on tertiary hospital care, on the grounds that it does not bring students face to face with the types of problem with which they would have to be able to cope in practice. These five schools, therefore, focused on community needs and

used them to shape and define their curricula. As one dean put it, "The purpose of the institution was to serve the community, not the students."

The other five schools, located in developed countries, had become student-oriented or student centred, paying special attention to methods of instruction. Furthermore, leading staff in these schools argued that the content of traditional medical education was inappropriate because the knowledge base was too large to absorb and was continually changing. The traditional methods were inappropriate because they concentrated on the memorization of medical and scientific facts that would be soon forgotten and/or outdated. Content, since it was continually changing, was regarded as less important. In these five schools it was considered of prime importance to develop ways of enabling students to learn how to solve health problems and how to teach themselves what they needed to know in order to do so. It was found in the study that while community orientation is not neglected by this group of schools, the emphasis is on the teaching and learning processes; in some cases traditional interpretations of the physician's role are implicit in their work.

3. PROGRESS OF THE SCHOOLS TOWARDS ACHIEVING THEIR GOALS

The Network of Community-Oriented Educational Institutions for Health Sciences was established to assist health training schools in the achievement of their common goal of community-oriented education of health personnel. Most of the ten schools in this study were founded mainly with a view to training health personnel in how to meet the health needs and problems of the community in which they are located. The Network schools support one another in this endeavour and encourage the development of other educational institutions that attempt to introduce innovations in the training of health personnel, with the ultimate aim of improving health care and helping to achieve the goal of health for all by the year 2000 through primary health care.

The Network schools work on the premise that a community-oriented approach in health personnel training will help in the establishment of improved health systems based on the primary health care approach. As stated earlier, the programmes of the ten schools promote, to varying degrees and with varying interpretations, the use of a community-oriented and problem-based approach in the training of health personnel.

This section describes the study's findings on the influence and impact of these schools in relation to their goals and character.

Outcomes studied and data used

Seven general categories of outcome were studied, the first four of them related to direct impact on the health care system. The seven categories are: (1) provision of health care by the educational institution itself; (2) the quality of health services; (3) the numbers of health personnel available and the provision of specialized care; (4) the primary health care approach, which includes the availability of basic health services, changes in policy designed to strengthen the primary level of care, and public health and preventive activities and programmes; (5) impact on the training of health professionals; (6) a comparison of graduates from the ten schools with graduates from other, more conventional schools and programmes; and (7) the degree to which the characteristics of graduates from the ten schools match up with school goals.

Table 9 lists the sources of the data used in assessing outcomes and reporting findings. For the sake of brevity and since the data sources are the same, the table condenses four categories - the provision of health care, the quality of health services, the availability of health personnel and specialized care, and primary health care - into a general category of impact on the health care system. Sources include for each school the published and unpublished documents it provided, a study survey it completed, and notes and observations resulting from the site visit. Individual schools have used quantitative data to assess graduates' performance and for a preliminary evaluation of programme impact. The quantitative data from the study survey, on-site interviews and observations, and school documents required simple statistical manipulation, such as the calculation of means and percentages. To capture the unique flavour and orientation of each school's programme, qualitative data were utilized from survey questions, on-site interviews and observations, and published and unpublished documentation about the processes and context of each institutional setting. These descriptive data make it possible to judge the educational innovation more realistically against the background of environmental factors that have an important effect on the character of each school.

The aim of the study was understanding rather than the determination of causal relations. Thus the findings in regard to outcome describe, in comparison with the other schools and with due regard for special circumstances, each school's initial progress towards meeting the health needs of the community.

Review of impact

This subsection is organized in accordance with the seven main categories of outcome mentioned above. The position in regard to each category is subjected to comparative analysis and Table 10 summarizes major findings in the various schools. Findings specific to each school are discussed in the next subsection, on individual school impact, and Annex 2 contains specific findings for each outcome category by school.

Impact on the health care system

1. Provision of health care by the educational institution itself

All the schools reported that health care was provided by teachers and students in the course of instruction and service (Table 10, column 1). Teaching and community hospitals and primary care clinics were the most common sites

(continued on p. 36)

Table 9. Data sources for each school

School/ Programme[a]	Impact on health care system	Impact on education of health professionals	Comparison of graduates with graduates of other more conventional schools or programmes	Characteristics of graduates in relation to school goals
BGU	Study survey School documents/publications Correspondence, Naggan May, 1985	School documents/ publications Study survey	Study survey School document – *Evaluation of Israeli internship programs*, 1984	Study survey School document – *Evaluation of Israeli internship programs*, 1984
UNC	Study survey	Study survey	Study survey	Study survey Feleti, G., et al., *Lancet*, **2**: 34–37 (1983) Site visit summary, Richards, 1985
RL	Study survey which cited *Statement of Government, 1984*	Study survey School documents/ publications	Study survey *Follow-up Basisartsen*	Study survey
UPMEP	Study survey Vantassel. J., *Kellogg Foundation Grant Project Evaluation*, 1984	Study survey	Study survey which cited National Boards Part I (evaluation for career advancement given nationally), clinical performance evaluations, clerkship content evaluations	Study survey
McM	Study survey which cited *Canada manpower data, Ontario task force reports* and regional health data	Study survey School documents/ publications	Study survey *M.D. Program Report*, 1984 Faculty of Health Sciences, McMaster *Synthesis*, 1985 Institutional self-study analysis	Study survey *Synthesis*, 1985 *M.D. Program Report*, 1984 Woodward, C. & Ferrier, B. *Medical education*, **17**: 54–60 (1983)

[a] BGU – Ben Gurion University, Beersheva, Israel
UNC – University of Newcastle, New South Wales
RL – Rijksuniversiteit Limburg (Maastricht), Netherlands
UPMEP – Upper Peninsula Medical Education Program, Michigan State University, USA
McM – McMaster University, Hamilton, Ontario, Canada

Table 9 (*continued*)

School/ Programme[a]	Impact on health care system	Impact on education of health professionals	Comparison of graduates with graduates of other more conventional schools or programmes	Characteristics of graduates in relation to school goals
PCC	Study survey Mennin, S., 1985, PCC presentation to Curriculum Committee	Study survey	Study survey Mennin, S., 1985, PCC presentation to Curriculum Committee Site visit summary, Richards, 1985 Kaufman, A., *Implementing problem-based medical education*, New York, Springer, 1985 Correspondence, Kaufman, November, 1985	Study survey Mennin, S., 1985, PCC presentation to Curriculum Committee Site visit summary, Richards, 1985 Kaufman, A., *Implementing problem-based medical education*, New York, Springer, 1985
CUSS	Study survey Site visit summary, Richards, 1985			
IOM	Study survey Correspondence, Acharya, Dec. 1985		Site visit summary, Richards, 1985	Site visit summary, Richards, 1985
UAM	Study survey Site visit summary, Guilbert, 1984	Study survey	Study survey	Correspondence, Mora, April, 1985
IHS	Herrera, the Institute of Health Sciences (unpublished school document) Site visit summary, Richards, 1985 Herrera, IHS, *A profile*, January, 1985	Herrera, IHS, *A profile*, January, 1985 Site visit summary, Richards, 1985	Site visit summary, Richards, 1985 Herrera, The Institute of Health Sciences (unpublished school document)	Site visit summary, Richards, 1985 Herrera, The Institute of Health Sciences (unpublished school document)

[a] PCC – Primary Care Curriculum, University of New Mexico, USA
CUSS – Centre Universitaire des Sciences de la Santé, University of Yaoundé, Cameroon
IOM – Institute of Medicine, Tribhuvan University, Nepal
UAM – Universidad Autonoma Metropolitana Xochimilco, Mexico City, Mexico
IHS – Institute of Health Sciences, Tacloban, Philippines

Table 10. Comparison of impacts of the ten schools

School/ Programme	Impact on health care system				Impact on education of health professionals	Graduates	
	Provision of health care	Quality of health services	Availability of health personnel and specialized care	Primary health care (policies, availability of basic medical services, integration of care levels, public health programmes)		Comparison of graduates with graduates of other established schools/ programmes	Characteristics of graduates in relation to school goals
A	School provides services in two hospitals and over 160 community clinics	Improved quality of hospital care	Increase in health personnel due to teachers and recent graduates; specialized care availability increased substantially owing to integration of health services and medical education and increase in medical teaching staff and graduates	Increased availability of primary care, especially family medicine, owing to integration of health services and medical education and increase in health personnel; influence on health policies toward primary health care via same integration	Includes integration of medical education with various levels of health delivery system plus acceptance of some methods by other schools	School-generated survey indicates graduates are comparable or better in skills, and more oriented toward community medicine in attitudes, skills and knowledge	Results of survey indicate graduates are meeting school objectives
B	No facilities operated by school; but staff and students serve in government hospitals and health care centres; students do extensive community work	No information available	Source of trained health personnel for the Ministry of Health, especially in primary health care	Very substantial impact on delivery system of the M.O.H., integration of health personnel training and health services delivery	Development and successful implementation of ladder curriculum; influence in the acceptance of community orientation by other schools, integration of training and health services	Medical students score comparably on national exams; students in lower phases of the career ladder score higher on national exams than national average	Students demonstrate commitment to community; very few graduates have left the country; the ladder career system appears to be successful
C	Operates	Substantial	Very substantial	Substantial influence	No information	No other schools in	At graduation

	primary care clinic; students involved in community work	improving hospital care	ing availability of nurses and other primary health care workers; substantial influence in specialized care availability			tions of supervisors indicate that graduates compare favourably with same nationality graduates of other countries' schools	classes, 10% indicated plans to go into community medicine; graduates enthusiastic about obligatory service
D	School operates four family practice units for instruction and patient services; staff and students assist in patient care in area hospitals	Influence in improving health care services through a regionalized system of health care delivery	Increase in number of physicians due to staff and graduates; increased availability of nurses	Influence on health policies towards primary care	Very substantial influence in development of programmes in other schools; influenced accreditation practice in North America; influenced faculty laws governing promotion, tenure and staff governance; physician licensure process reviewed	Graduates feel they are as well trained as those of other schools; 50% go into family practice/ general practice, same as other schools; score as well as or better than others in national examinations	Graduates' self-assessments are consonant with programme goals
E	Partnership with nonprofit corporation allows operation of two community primary care clinics; teaching staff and students assist in patient care services in area hospitals	Somewhat improved quality of care provided by community physicians	Increase in availability of physicians, especially general practitioners owing to graduates and teachers being drawn to region because of school; somewhat improved availability of specialized care	Increased availability of basic medical services (established two primary care clinics), hospice and jail health programme, health care for disabled, smoking and obesity control programme, physical examinations for student athletes	Focal problem approach has been accepted by conventional track within school; also adopted by other schools	Innovative track comparisons with conventional track within school indicate that innovative students score as well as or better than conventional students in medical examinations	No information available

Table 10 (*continued*)

School/ Programme	Impact on health care system				Impact on education of health professionals	Graduates	
	Provision of health care	Quality of health services	Availability of health personnel and specialized care	Primary health care (policies, availability of basic medical services, integration of care levels, public health programmes)		Comparison of graduates with graduates of other established schools/ programmes	Characteristics of graduates in relation to school goals
F	School assists in provision of patient services in teaching hospital and community hospitals and clinics	Improved practice by community physicians; creation of interface between hospital care and general practice	Availability of health personnel reported not a problem; increased specialized care and creation of interface between hospital care and general practice called "Diagnostic Centre"	Influence on primary health care policies	Influence in way new schools mandated by government to conduct medical education; other schools have accepted teaching methods; government has created funds for general practice programme after negotiations with Dean	Comparative study under way	No information available
G	Students and staff provide patient services through relationship with area health service units; students involved in community health work	No reported improvement in quality of care	Moderate increase in availability of general practitioners; availability of specialized care reported not a problem	Initial coordination with social security health care to integrate medical education with health services for specific catchment area; policy influence toward primary health care; increased availability of basic medical services	School has had perceptible role in development and improvement of medical education in the country; acceptance by other schools of community orientation and educational methods	Long-term evaluation of the mandatory rural service under way; preliminary results indicate graduates are equal in clinical knowledge and superior in public health areas compared with graduates of other schools	In recent survey graduates appear evenly split between general practice or public health and speciality practice
H	Area hospitals rely on teaching staff for	Improved quality of hospital	Availability of physicians reported as not a problem;	Increased availability of basic medical services, moderately	Acceptance of some methods by other schools,	Long-term evaluation under way on part of school; comparable	Initial assessment of first class indicates

	patient care; school does not operate a hospital	care	no impact on other health personnel; increased availability of specialized services	improved maternal/child health services, health education for public	e.g., other schools making admission policies more liberal	performance levels on patient management problems with graduates from two other schools; residency supervisors observe graduates to be more caring with patients	graduates are meeting objectives
I	School has teaching hospital; students active in patient care in year 1 (rural clerkships) and year 4 (rural subinternships)	Not available	Not available	Not discernible since graduates not yet practising, but surveys show graduates retain primary care preference throughout undergraduate education	Teaching staff have consulted with several other schools on problem-based learning methods and community orientation; conventional track has adopted some PBL methods	Comparison with conventional track shows innovative-track students comparable in skills and knowledge; better in reasoning, initial clinical skills and problem-solving; innovative-track students begin programme with different personality characteristics, e.g., more independent and self-confident	Attitudes are consonant with goals; too early to evaluate practice
J	Teaching staff serve in two hospitals and in primary health care clinics: M.O.H. operates all facilities and staff and students participate in all health care activities	Very substantial impact in improving hospital care	Very substantial impact on availability of physicians (10 years mandatory government service) and specialized care availability	Very substantial impact on availability of basic medical services; has influenced policies and activities in primary health care	No information available	No information available (only medical school in country)	No information available

reported by the various schools; some schools provide instruction and care at less common sites, such as rural health posts, schools, factories, and general practitioners' offices. In most of the schools, teachers were found to be an important component of regional health personnel, local hospitals depending on them for the provision of health care. Four of the ten schools operate hospitals and outpatient clinics; two operate outpatient clinics only. In seven cases, the school or programme operates a health service (in the form of a health education programme, a rural care clinic or a rural district hospital) of a type that exemplifies the goal of the programme in regard to meeting needs in certain underserved areas. In five cases, the schools or programmes actually provide some form of health education or other public-health-oriented programme. The level of students' responsibility for patient care varied in the different innovative schools. Students in developing countries had more responsibility for health care delivery earlier in their training, commonly in rural community settings.

2. Quality of health services

Most schools reported that the presence of the innovative school or programme and its graduates had had an impact on the health care system, particularly in the way of improved hospital care and medical practice. Seven schools reported improved hospital care and half the schools reported an improvement in the standard of care provided by community physicians. Column 2 of Table 10 reviews this category of outcome. The specific responses from each school to survey questions regarding quality of care and the availability of specialized care are given in Annex 2, Table A2.1.

3. Health personnel and the availability of specialized care

In three cases, schools reported a very substantial or substantial impact on the availability of physicians, particularly general practitioners. An increase in the availability of specialized care was reported by six schools.Two programmes have resulted in a significant increase in the availability of nurses. In two other cases, substantial numbers of other types of primary health care worker have become available as a result of the programme. Finally, two programmes reported very significant increases in the availability of specialists. One school reported that over 100 physicians had been attracted to the area of the school since its opening and that there had been an increase in the number of graduates choosing primary care as their field of practice. In three schools the innovative programmes are too recent for their impact on health personnel to be assessed.

Three schools reported launching initial educational and/or retraining programmes for rural nurses. One school reported the establishment of two primary care clinics caring for more than 20 000 patients. There have been significant im-

provements in the staffing of rural clinics and district hospitals, which before the launching of the programme had no physicians at all. In one programme, the impact on the availability of health workers other than physicians has been very dramatic. In another case, all posts in the Ministry of Health available for midwives in the region, for example, have been completely filled from among graduates of the programme.

Column 3 of Table 10 summarizes this category of outcome, while Table A2.2 in Annex 2 summarizes the specific responses to the survey from each school. Whenever supporting evidence was available, it is cited in Table A2.2.

4. Initiatives in favour of the primary health care approach in areas of policy, basic health services, and public health preventive programmes

Eight of the schools reported that they had had at least some influence on health care policies in favour of a primary health care approach; three reported having had a substantial and two a very substantial influence. The extent and nature of the influence they have exercised on policy cover a wide range and include the establishment of joint policy committees, modification of the policies governing the management of community hospitals, influence on the formulation of government policies in the direction of a primary health care approach, regional health data collection projects, the issuing of reports on health conditions in rural areas covered by the graduates of a programme, special treatment by the government of several schools as a way of exemplifying the direction that other schools should take, cooperation with the Ministry of Health in developing monitoring systems in rural areas and in the formulation of national policies and strategies for primary health care, and policies to integrate public-health and hospital services in rural areas. Survey data indicated that the availability of basic health services had improved in seven cases. One school mentioned a major improvement in the integration of basic, secondary, and tertiary levels of care throughout the health care system of the area it serves. Influence on the institution of new public health programmes appears less evident; three schools reported an influence classified as substantial or moderate.

Column 4 in Table 10 summarizes outcomes in the primary health care category, while Table A2.3 in Annex 2 tabulates the specific responses to the survey from each school.

Summary: impact on the health care system

As already stated, all the innovative schools or programmes reported that their presence and subsequently the presence of their graduates had had an impact on the health care system. It is not possible, however, to distinguish the effects of the in-

novation from the purely quantitative effects of having one more school, particularly in an underserved area.

Most of the schools reported an increase in basic or primary health services as one of the major results of their influence. Evidence of how that influence was exerted included involvement of the school or programme in teaching and service activities, involvement of its graduates in providing those services and the attraction of other health personnel to the region by the school's presence. Other types of impact reported by many schools were increased availability of specialized care and improved quality of care in teaching, regional, district, and local (community) hospitals. Most of the schools reported that they had influenced the government to reorient its health care policy and services in the direction of primary health care, including community medicine.

Half the schools reported that their influence had resulted in increased health education activities in addition to increasing the numbers of other community health personnel, such as nurses and midwives and making their training more relevant. As expected, increased numbers of physicians, particularly general practitioners, were also reported from those schools with practising graduates.

The data for assessing the above outcomes were taken from the study survey and observations during site visits. Because most of the schools were established fairly recently, it has not yet been possible to carry out extensive evaluation studies on their impact on the health care system, particularly in regard to the development of the primary health care approach. A few schools have attempted preliminary assessments in that respect and these were used to cross-check responses to the study survey and observations during site visits. The data schools reported in response to the study survey may be viewed as a first step in assessing the outcome of their activities in a way that takes into account their particular characteristics and the constraints under which they labour.

Impact on the education of health professionals

All the schools studied were found to have had an influence on the education and training of health personnel, affecting government educational policy, university governance and professional regulation procedures, teaching methods and educational philosophy. The degree of influence exerted ranged from moderate to substantial and the impact ranged from regional and national to international; some schools in the study served as models on various aspects for the group as a whole. Table 10, column 5 contains summary findings for the entire group; survey data from individual schools are shown in Table A2.4 in Annex 2.

The evidence, mainly supplied by the schools themselves, is that they have all influenced health personnel education and training. All the innovative schools and programmes reported that some aspect or aspects of their approach to medical education had been adopted by other schools or programmes for training health personnel. The staff from many of the schools covered by the study were reported to be offering consultation and advice to more traditional programmes regarding aspects of their innovative problem-based and/or community-oriented approach to the education of health personnel. These activities ranged from ad hoc workshops to continuous institutional collaboration leading to innovative educational policies and methods being adapted or adopted outright. Examples given were early involvement of students in practical work, especially in a primary care or community setting, and the training of teachers in problem-based methods.

Some schools were reported to have influenced national or regional educational policy by participating in advisory groups. One school was also reported to have influenced the government to allocate resources for medical education in keeping with the school's goals and innovative educational approach. Schools were less frequently reported to have influenced national examinations for licensure or regulations regarding the promotion and tenure of teaching staff. However, this may be due primarily to the fact that only four out of eight countries have national examinations for licensure. Two schools had the only medical programmes in their respective countries and national examinations for licensure were consequently not relevant.

Two very important achievements in the training of health personnel reported by a few schools were adoption of the ladder curriculum concept and the integration of medical education with health services delivery. A ladder curriculum allows those being trained to progress to a level commensurate with their ability and motivation and with a region's need for the particular category of health worker concerned, thus making highly efficient use of training resources. One school has successfully adopted a ladder curriculum and produces community health workers at different levels, viz. village health workers, midwives, nurses and physicians. All students

begin at the first level, that of village health worker, with selected persons moving on to the next level, and so on until a few complete the physician training. Nearly every student admitted is thus given some functional training, so that the physicians have also received training as nurses, midwives, and health workers.

Relevance and the prudent use of health resources are also characteristic of the programmes that are striving towards structural integration, or at least coordination, with health services delivery. A successful and comprehensive model of integration of medical education with health services delivery is that implemented by School A and a national health insurance system for the school's designated catchment area. By assuming responsibility for all levels of health care delivery the medical school closely matches medical training to the health service needs of the population in the catchment area. School B has also achieved integration of health personnel training with services delivery, largely through the sharing of staff and the fact that the Director of the programme is also Director of Regional Health Services, which is also true for School A. On a smaller scale and in a different context from the point of view of health economics, there is coordination between Programme E and a non-profit corporation in the provision of primary care services for the region in which the programme is located.

Graduates

Comparison of graduates from innovative schools with those from other schools

One of the aims of the study was to find evidence as to how graduates with this sort of medical education compared with graduates of established programmes. Despite the fact that the purpose of the innovative programmes was to train health personnel with distinctive characteristics, evidence was also sought as to how far graduates from those programmes met traditional standards. There appears to be a tendency for the standards in question to be concerned with knowledge of the basic sciences and ability to provide tertiary care. Although such standards seem inappropriate as a means of assessing the quality of innovative programme students, they were used in the initial stage of comparative assessment because they were the only ones available. Comparisons of graduates from the innovative schools with medical graduates from other schools within the same country have been carried out to varying degrees by most of the ten schools. In two schools where there are innovative medical programmes side by side with traditional programmes, the two courses were compared. The comparisons ranged from informal, anecdotal observations of graduates by medical educators such as clinical supervisory personnel to more formal, rigorous comparative assessments, in some cases longitudinal. Similarly, the characteristics compared ranged from traditional qualities (cognitive and clinical performance)

to the characteristics thought specifically desirable in the light of the goals of the innovative schools, such as community-orientation and problem-solving and self-learning skills. Comparative evaluations carried out by the schools were used as sources of information in addition to study survey data (Table 9, column 3).

The performance of the graduates of the ten innovative schools or programmes was comparable or superior to that of graduates from traditional schools in all areas evaluated. None of the interschool comparisons indicated that innovative-school graduates performed worse than traditional-school graduates in such traditional ways of measuring achievement as national examinations or the observation of clinical skills in internships and residencies. A preliminary summary of the trends shown by the data is given below.

Knowledge of basic sciences: On the whole "innovative" students compared favourably in the examinations. However, there is an impression that their knowledge of the biological sciences is less detailed than that of students in long-established programmes.

Clinical performance: Some data suggest that the students in some innovative programmes may be better problem-solvers and that they are more skilled in clinical work, especially in dealing with patients. This may be a difference that will tend to disappear as "traditional" students gain more experience in patient care.

Patient orientation: From evidence that is mostly anecdotal, it would appear that "innovative" students are more concerned, more committed to patients, better communicators and strong patient advocates.

Orientation to health needs: The "innovative" students appear to have markedly more knowledge regarding public health, community medicine, epidemiology and health in relation to the social and community environment as well as a better understanding of how to apply such knowledge.

Characteristics of graduates in relation to school goals

A common goal of the schools covered by the study is to produce graduates with specific characteristics such as community orientation, commitment to the health of the people, problem-solving and self-learning skills, and knowledge in preventive medicine and public health. The results where schools have assessed these features indicate that their graduates' performance is generally in conformity with the schools' goals (Table 10, column 7).

Since most of the schools are of fairly recent establishment, it is either too early yet to assess practice location and career choice or else the available information

is inadequate (see Annex 2, Table A2.5). However, where data are available, they show that a proportion ranging between 61% and 100% of the graduates from the innovative schools concerned are involved in community service and primary health care activities or primary care practices and residencies (general medicine, paediatrics, family practice). It should be noted, however, that the 100% figure occurs in countries with obligatory government service. Moreover, there are no data to compare the distribution of career choices among graduates of other medical schools in the same region and/or country.

Since schools vary in their emphasis on and definition of community-orientation and problem-based learning, their goals and the assessment of the extent to which they are achieved likewise vary. Accordingly, the emphasis in evaluation ranges from cognitive reasoning and problem-solving abilities to assessment of attitude toward community orientation, teamwork and the preventive aspects of health care.

The sources of data on graduates' characteristics and the extent to which they match up with the schools' goals are essentially the same as those used for comparing graduates from innovative and non-innovative schools (Table 9, columns 3 and 4). Survey data, notes from the site visit, and school reports and publications were utilized where possible and appropriate. Some schools are undertaking longitudinal studies of their graduates, which will be invaluable in assessing continuing and future achievement of school goals, especially if similar data from traditional schools are available for comparison.

Summary of findings

The study sought to describe the progress of ten community-oriented medical schools in the following areas:

(1) impact on the health care system;

(2) impact on the education of health professionals; and

(3) the training of competent physicians with an outlook, skills and a degree of commitment consonant with the schools' community-oriented principles.

It was found that:

(1) The innovative schools or programmes have all influenced the health care system by changing, and encouraging change in, the quantity, quality and/or nature of health care services, activities and personnel.

(2) Similarly, all schools covered by the study have influenced the education and training of health personnel through their impact on educational policy, on university governance and professional regulation procedures, and/or on teaching methods, educational policy and community orientation.

(3) Lastly, graduates of the schools concerned were found to be competent when assessed according to traditional standards. Moreover, the way they think and act in the professional sphere is consonant with the specific goals of the programmes under which they were trained.

Individual schools: outcomes and impact

This section deals with each school and its reported influence in respect of the seven outcome categories reviewed in the previous subsection. The specific responses from each school in regard to each outcome category are tabulated in Tables A2.1 to A2.5 in Annex 2.

School A

School A was established to meet the known health care needs in its specific catchment area by means of comprehensive health care services rendered by medical personnel trained to understand the population's health problems. Medical education is closely linked with actual provision of health services throughout the programme and the school is an integral part of the health services system. The primary health care approach pervades the students' learning activities and the actual delivery of health services.

Impact on the health care system

School A reports having the greatest impact in increasing the availability of physicians (including general practitioners), providing primary and specialized care and improving the quality of hospital care. Of equal importance has been the fact that it has influenced health policies in the direction of primary health care through the integration of health services and medical education. Evidence of the impact the school has had includes an increase in the number of physicians in the region, comprising over 100 attracted to the area since the school opened its doors, roughly 50 recent medical graduates who will work in primary care for at least a year each, and

an increased number of family medicine residents (up from 9 to 35 in 5 years), most of whom will remain in the area. Furthermore, by making the regional hospital a teaching hospital, the school believes that it has improved the quality of care in this, the only hospital for the area. The influx of specialists living and/or travelling in the region, and improved inpatient and outpatient hospital facilities are also considered to have extended the availability of specialized care. The structural merging of medical education with health service delivery and the accompanying policy trends in the education and health sectors are inherent in the way the medical school is organized; the Dean of the School is also Director of Regional Health Services. In addition, the appointment of academic staff to health service positions strengthens the links between medical education and health care and ensures that the school will continue to influence policy to a considerable extent.

School A reported that it had also had an impact in (*a*) making increasing numbers of nurses available by establishing a four-year nursing school with a bachelor's degree in community nursing, (*b*) improving maternal and child health services by instituting paediatric residencies and using senior-year students as residents in the community, (*c*) increasing the attention paid to health education for the public by involving graduates in community health projects and by conducting health education programmes in the community that have been sponsored by a national health insurance and service system.

Areas in which the school has had some impact include: (*a*) making increased numbers of other primary health care workers available, for instance through a clinic managers programme, (*b*) increasing the availability of basic medical services by using a mobile unit to serve a specific underserved population and improving the utilization of existing services, (*c*) instituting new public health measures such as oral rehydration therapy for infants, and (*d*) reducing malnutrition in an at-risk target population by using a mobile clinic to educate mothers, treat diarrhoea and carry out feeding therapy.

Impact on the education of health professionals

School A reported that its integration of hospital care, outpatient care and community medicine into one establishment had had a very substantial influence on the education of health personnel. The concept of integration of health systems and manpower development is put into practice through a contractual agreement between the medical school and the health services. This arrangement is strengthened by the fact that the Dean of the Medical School is also Regional Director of Health Services. Evidence of subsidiary influence is provided by the acceptance and implementation on the part of other schools of various aspects of the innovative school's approach - earlier contact of students with patients and health problems, learning through experience outside the hospital, and teacher training. The school

also believes that it has influenced other schools to a lesser extent by advocating the licensure of physicians through national licensing examinations and promoting laws governing career advancement, tenure and the management of teaching staff. In this last respect other schools are developing teacher-training workshops and taking educational performance into account when promoting staff.

Graduates

Graduates of School A were compared with graduates of other medical schools in the same country by means of a questionnaire drawn up by the school and sent to all interns on completion of the 1983/84 internship programme. Preliminary results indicated that School A graduates paid greater attention to values connected with doctor-patient relationships, teamwork, the community, and preventive aspects of health care. Furthermore, a greater proportion felt more competent in technical skills, behaviour and attitudes to patients than graduates from other medical schools. A greater proportion of School A graduates had participated in research projects as undergraduates and had written scientific papers during their internship. The results of this survey seem to indicate that School A graduates are meeting their school's objectives.

School B

The Health Sciences Programme of School B was drawn up with a view to improving the health care available to a poor rural population by training community members to provide health services at various levels. It is distinguished by its ladder curriculum, its integration of health training with the provision of health services, its strong community orientation and community basis and its use of health workers as community organizers.

Impact on the health care system

There is evidence that this health sciences programme has had a very significant impact on the Ministry of Health system for the delivery of health care in one region. Data from the site visit, data reported by the school itself and Ministry of Health documentation support that conclusion. School B participated in the Ministry's formulation of policies and implementation strategies for primary health care and integrated public health and hospital services in rural areas. The school appears to have had a very substantial impact in increasing the number of health personnel, in that 469 students have graduated from the various programmes: 102 as village health workers, 244 as community health workers, 54 as community health nurses, 57 with Bachelor of Science degrees in community health, and 12 with medical degrees. The educational programme provided the Ministry of Health with health

workers at all levels. As a result, the region has filled all its positions for midwives, sanitation workers and registered nurses; there is still a shortage of physicians, especially in the rural posts. The programme's village and community health programmes have expanded primary health care activities in the rural communities. Seventy-five per cent of the students returned to their home village during their service periods. The community health nursing programmes have made community-oriented nurses available for service in the rural health unit of the Ministry of Health. As the founding Dean writes "One of the best indicators of the success of the programme, at least in developing the students' commitment to serving in the rural areas, is the fact that only three of the (then) 420 graduates have left the country."

Impact on the education of health professionals

School B appears to have had a substantial influence in the way that new schools have been mandated by the government to conduct medical education (non-survey data). It reports that its role as a model for community-based training of health professionals has had a very substantial impact. Since the programme was launched, various medical, nursing and midwifery schools have been allowed to operate on the understanding that they offer aspects of a community-based primary health care curriculum.

The contrast between the relatively low entrance qualifications and the superior performance of School B's nursing and midwifery graduates in national examinations has called into question current methods for evaluating new graduates. Competency-based examinations are now being considered by the Board of Medical Examiners. The school views these attitude shifts as a credit to its influence and success in the field of health personnel education for the country. Moreover, leading members of the programme's staff are actively participating in a national review of medical education which will inevitably recommend changes in medical education consonant with many of the approaches used at the innovative school (non-survey data).

Graduates

There has not been any comparison of School B medical graduates with graduates from other medical schools. However, of students in the other phases of the curriculum ladder, taking either the community health worker (midwifery) national certifying examinations or the national nursing examinations, a significantly higher percentage than the national average obtained passes (95% vs. 68% and 83% vs. 53%, respectively). Comments by teaching staff, provincial health officers, and other health administrators in the region reveal that School B graduates in midwifery and

nursing are regarded as "model" health workers who are given priority when openings occur. Anecdotal evidence suggests a demand for the medical graduates not only from local government officials and community leaders, but also from patients they have attended during training.

A further note on School B students and graduates illustrates the success of the ladder curriculum. Of the initial 96 students who studied midwifery and achieved a 95% passing rate, 49 were selected to go on to the Community Health Nursing course. Of these 49 nursing students (who achieved an 83% passing rate), 30 went on to the next step in the ladder system, the Bachelor of Science in Community Health (BSCH). Twelve of the 20 BSCH graduates went on to the M.D. programme and are graduating at this final level of the curriculum.

The community commitment of the graduates, their readiness to practise in the community, and the apparently successful ladder curriculum indicate that the school is attaining the goals it set itself.

School C

School C was established to train the country's physicians to meet national health needs instead of relying on educational facilities in other countries for their training. The programme stresses health team training, the integration of health personnel education with the health services sector, community-orientation, prevention and research based on national needs.

Impact on the health care system

School C reported that it had had a very substantial impact on the availability of nurses and other primary health care workers through its various training programmes for: (a) auxiliary nurse midwives (three schools), certificated and post-basic nurses, and (b) health assistants, ayurvedic assistants, and community medicine auxiliaries. It also reported substantial impact in influencing health policies in the direction of primary health care, increasing the availability of basic medical services and specialized care and improving the quality of care provided in local hospitals. The running of a major health post and the new teaching hospital are cited as reasons for the increase in the availability and quality of services. To a lesser extent the school has exerted an influence by increasing the number of general practitioners available and encouraging greater attention to health education for the public. The nature of the programme itself and the health education conducted by teaching staff during community training of students are considered to be the basis for the school's influence.

Impact on the education of health professionals

School C reported that it had had a very substantial influence on the way new schools are mandated by the government to conduct education and training programmes for health personnel. It reported that it had had a moderate influence on the way the government funded medical education and also on the licensure of physicians.

Graduates

It is not possible to compare School C graduates with others because it is the only medical school in the country. However, observations from clerkship supervisors indicate that School C graduates are clinically more skilled than interns trained outside the country who are also at the regional hospital. Final clinical examinations for the first class (1984), conducted partly by external examiners, showed very good results and the general impression given by School C graduates is that they are more oriented towards practice and prevention, and better able to undertake public health activities within the country than their foreign-trained counterparts.

Despite these positive indications, the results in regard to the school's goal of producing community-oriented, primary-health-care physicians seem to have been mixed.

The head of the Community Medicine Programme gave figures from surveys of medical students on entry and on graduation. On entry to the medical school, 75% said they planned to take up a career in community medicine. At the conclusion of their studies, the percentage was down to 10%. The students gave (*a*) lack of prestige, (*b*) low salary, (*c*) family hardships, and (*d*) lack of health-care infrastructure as reasons for their disenchantment with community medicine. In spite of this, School C graduates are much more willing to complete their obligatory service in the district hospitals than graduates trained in a neighbouring country.

School D

The medical programme of School D places very great emphasis on problem-based learning and has been an international model for its development for the education of health professionals. The school has been instrumental in regionalizing health care delivery services and operates four family practice clinics where students learn and services are provided.

Impact on the health care system

Responses from School D indicate that it has had a moderate impact in making more physicians, general practitioners and nurses available, as shown by national manpower data. It reported a similar impact in influencing health policies in the direction of primary care, improving the quality of care provided in local hospitals, improving the standard of medical services provided by community physicians and increasing the availability of specialized care. Regional task force reports, regional health data, assessments of the quality of consultations, and national manpower data are cited to substantiate these claims. School D has had a substantial impact in improving health care services through its influence in developing regionalized services. The Associate Dean for Health Services who serves on the teaching staff plays an important role in facilitating the joint planning and implementation needed in such a system. A moderate degree of impact was reported in regard to increasing the attention paid to health education for the public and instituting new public health measures.

Impact on the education of health professionals

School D has had world-wide influence on the education of health professionals since it is a leading institution for innovative medical education. Although not specifically reported in the survey, it has served as a model and an international resource for medical educators, and especially for the development and practical utilization of problem-based learning. The school reported that it had had a very substantial influence on regulations governing promotion, tenure and governance of teaching staff and the development of specific guidelines on teaching staff at other schools. A recent move to review licensing procedures owed much to a member of the school's teaching staff. The school had had moderate impact on accreditation practices as a result of its influence in the national association of medical colleges. Similarly, it reported that it had influenced the way in which the government funded medical schools by participating in a Regional Council of Faculties of Medicine.

Graduates

A comparison of School D graduates with graduates from other medical schools in the country showed that they had made similar career choices, approximately 50% entering family or general practice. School D graduates have obtained average or better than average marks in national licensing and certifying examinations. Supervisors' ratings of recent graduates are largely positive and appear to be roughly equivalent to their ratings of graduates from other schools. Ninety per cent of

graduates surveyed considered themselves to be as well trained as or better trained than graduates from other programmes.

Surveys of students on graduation have indicated that they believed that the programme's strong points, particularly problem-based, self-directed learning, had enabled it to fulfil its declared goals.

Medical Programme E

Medical Programme E provides training in a largely rural, underserved area and relies mainly on community physicians to guide students during the two-year period. A partnership with a non-profit corporation makes it possible to run two community primary-care clinics. The main emphasis is on primary health care; other types of care are learnt in a hospital setting. Problem-based learning characterizes the first two years of education.

Impact on the health care system

Programme E reported that it had had a substantial influence in increasing the availability of physicians, general practitioners and basic medical services. This is shown *inter alia* by the number of programme graduates practising in the region, the establishment of two primary-care clinics used by approximately 20 000 patients, and the fact that other practitioners have been attracted to the area by the presence of the programme.

The programme was reported to have had a moderate impact in increasing the availability of specialized care, improving the standard of medical services provided by community physicians, providing a better standard of care in local hospitals, increasing the attention paid to health education for the public and influencing health policies in the direction of primary care.

Impact on the education of health professionals

Programme E reported that its use of problem-based learning had influenced the rest of the school's curriculum and thereby contributed to the acceptance of problem-based learning in medical education.

Graduates

Since there is a traditional medical training programme in the same school, comparisons have been possible between conventional-track and innovative-track students. Innovative-track students (Programme E) scored as well as or better than con-

ventional students in a national examination taken after the second year. There have been no significant differences between the two tracks in examinations on the knowledge acquired at the end of each course. Career choices have varied between the two groups; a higher percentage of innovative-track students have taken up family practice, paediatrics and psychiatry, while a higher percentage of conventional-track students have taken up surgery.

School F

School F was established in an economically depressed region to develop a system of medical education relevant to the primary health care needs of the region. The educational programme is characterized by problem-based learning in small groups, with heavy reliance on community general practitioners as tutors during primary care training.

Impact on the health care system

School F reported that its influence had been greatest in redirecting health policies towards primary health care and improving the services provided by community physicians. It also reported an influence in the form of a better standard of care in local hospitals, increased availability of specialized care and the establishment of a "diagnostic centre providing a meeting ground for hospital services and general practice".

Impact on the education of health professionals

Survey data from School F indicate that the medical school has had a substantial influence on the way existing schools are directed by the government to conduct medical education. The school also reported that other schools had accepted various aspects of its educational approach, for instance by using its teaching methods. The school had also influenced government funding of medical training; the government had allocated money for the education of general practitioners after negotiations with the Dean of the School.

Graduates

The drop-out rate from Programme F is less than half that of other medical schools in the country (10% as against 20-25%). Assessments of students in medical schools throughout the country at the beginning of their fifth year showed School F performance levels comparable with those in the other schools.

COMMUNITY
328, V Main, I Block
Koramangala
Bangalore
India

School G

Like many of the programmes already mentioned, School G was established to train personnel to meet the health needs of a specific geographical area, with emphasis on community-oriented primary health care. The school is committed to studying the interaction between the multiple factors that affect health and disease, making its curriculum relevant to social conditions and developing problem-solving skills in students.

Impact on the health care system

It was reported that the influence of Programme G on health care delivery and general health status was difficult to determine because of the general tendency for health to improve in the country concerned. Reports on health conditions in rural areas that have been continuously served by the school's graduates for the last four years show a decrease in malnutrition, an increase in the availability of potable water, an improvement in maternal and child health and an increase in community health education activities. The programme reported that it had had a moderate influence in reorienting government policies towards primary health care and increasing the availability of basic medical services. The initial collaboration between government health services and the school was cited as evidence of the school's influence in this area.

Impact on the education of health professionals

Programme G reported that it had influenced the education of health professionals through the way in which new schools are directed by the government to conduct medical education. This is shown by the fact that the school plays a pre-eminent role, despite its small size, in a health care services/universities commission to upgrade medical education. Moreover, the school reported that it had succeeded in persuading other schools to adopt various aspects of its innovative approach in medical education. The school's wide influence is demonstrated by its participation in meetings and workshops on medical education, the provision of other schools with consultants, and the development of formal working relationships with five other schools both in and outside the Network and the country.

Graduates

School G graduates were compared with graduates from other medical schools in the same country during the obligatory year of service in rural areas. Preliminary results indicated that at the beginning of the rural service year, School G graduates

were equal to graduates from other schools in clinical knowledge and excelled them in public health subjects and activities. At the end of the rural service year, School G graduates excelled in all respects. To monitor the degree to which the school goal of training physicians for primary health care had been attained, a brief survey of career choice was carried out among the 1980 class, consisting of 141 graduates. Those responding (77) all came from large cities and/or were in postgraduate training, which may have injected an urban bias into the responses received:

General practitioners	31	40%
Postgraduate medical training (hospital residency)	34	44%
Public health (M.P.H. or similar)	6	8%
Basic sciences (M.Sc. or Ph.D.)	4	5%
Non-resident specialization	2	3%
	77	100%

The responses also showed the places of work of the graduates:

Private	9
National health institutions	41
Universities or other educational institutions	5
	55 (22 are still in training)

School H

School H was established in a medically underserved region to train physicians who would meet the health needs of the region in both community and individual medical care. The school uses problem-based learning and extensive community resources in the way of health personnel and establishments for the training of its students.

Impact on the health care system

Responses from School H indicated that it had had a moderate impact on health care delivery, leading to improved maternal and child health, increased attention to health education for the public, increased availability of basic health services, a better standard of care in local hospitals and increased availability of specalized care. The evidence for these results is anecdotal and reports improved specialized services, particularly in paediatrics, obstetrics and gynaecology, and immunology.

Impact on the education of health professionals

School H reported that it had had a moderate degree of success in persuading other medical schools to accept some aspects of its approach to health education. In particular, other medical schools are making their admission policies more liberal, in accordance with the practice in School H, where stress is laid not only on academic achievement but also on interpersonal skills and attitudes reflecting flexibility, creativity, integrity and ability to make decisions.

Graduates

A long-term evaluation study of School H has included comparisons between its graduates and graduates of two other medical schools in the same region of the country. A similar set of patient management problems is administered to all graduates and the results so far reveal similar levels of performance among the three schools.

An initial assessment of the first class of graduates (1982) in matters related to programme objectives produced results that were considered quite satisfactory. Graduates appeared to possess attributes and skills consonant with programme objectives.

Programme I

Programme I began as an alternative track in an established medical school and was intended to produce physicians trained to meet the health needs of underserved rural populations in the region. Those who launched the innovative programme looked on it as a potential catalyst for change in the traditional medical programme. The innovative course stresses the primary health care approach and relies on problem-based learning.

Impact on the health care system

No impact on health care delivery is yet discernible since the first class is still in residency. A recent evaluation noted that the majority of innovative-track students had retained a preference for family practice throughout medical school and intended to enter family practice residencies. The conventional-track students, however, although initially expressing a preference for family practice, had changed their minds by the time they graduated, when the majority of them came down in favour of the specialities.

Impact on the education of health professionals

The programme's impact on the education of health professionals has been mainly through giving consultations and advice to a number of schools trying to start their own specially adopted innovative programmes. This work has been on a national and international scale. In addition, the conventional-track programme in the medical school now uses some aspects of problem-based learning in some of its disciplines.

Graduates

There has been no comparison of the innovative track students with medical graduates from other schools, but there have been some comparisons between the two tracks in the school itself. Results in the national examinations are comparable and third-year clinical performance for the two tracks shows no significant difference. Assessments by teaching staff indicate that innovative-track students have better interpersonal skills and achieve a higher score than their conventional-track counterparts in cognitive reasoning, initial clinical skills and problem-solving. It is noteworthy that from the beginning innovative-track students are more independent and self-confident.

School J

School J was founded to train a variety of health care personnel - physicians, nurses, midwives, nursing aides and health technicians - in ways relevant to the country's health needs. As the country's first health sciences centre, it assumed responsibility for training health personnel at all levels. Initially the main emphasis was on primary health care; current goals lay greater stress on contemporary bioscientific approaches to medical care than was originally the case.

Impact on the health care system

School J reported that it had had a very substantial influence in increasing the availability of physicians, particularly general practitioners, basic medical services and specialized care, and in improving the standard of care in local hospitals. Support for these statements can be seen in the increase in the number of doctors trained in the national medical school; the majority of graduates are given postings as general practitioners throughout the country, and there are now medical officers in all local hospitals. The school has also succeeded in influencing health policies in the direction of primary health care, improving maternal and child health and instituting new public health measures. For example, new health care centres have

been established and allied health staff have been trained. The school reported that it had had a moderate influence on increasing the availability of other primary health workers and the provision of safe drinking-water (doctors train village health workers whose duties include development of potable water supplies), reducing malnutrition in the surrounding population (community nutrition education), encouraging the paying of increased attention to health education for the community and improving the quality of the medical services provided by community physicians.

Graduates

School J is the only medical school in the country, and there has been no comparison of its graduates with those of other countries. All graduates are obliged to go into government service for ten years, mainly in the rural areas. Virtually all graduates are therefore general practitioners.

4. SUMMARY AND COMMENTS

Probably every medical school ever established has set itself the task of serving humankind. A medical school sees whatever activity it teaches - biomolecular research, primary health care services, or the creation and application of new diagnostic and therapeutic techniques - as serving the needs of the people. The purpose of this study was to describe ten schools thought to be serving the needs of the people and all of which had community orientation as their main tenet.

The ten schools are very different from one another. They could not be expected to be similar, even though they all call themselves community-oriented or have been called so by others. The schools were established at different times and under different circumstances to achieve somewhat differently stated goals. They developed different approaches to achieving their goals, as was inevitable in view of the diverse political, economic and social circumstances under which they worked. A diversity of approach among the ten schools is not merely desirable; it is imperative if their objectives are to be achieved. The fact that the ten schools belong to the Network of Community-Oriented Educational Institutions for Health Sciences and their selection for this study are both due to their professed commitment to the design and implementation of health manpower training policies that would further the development of primary health care.

All ten schools were considered to have attempted to use problem-based learning and community-oriented medical education as a means of achieving relevance to health care needs. The study, therefore, concerned itself with the five questions set forth in the Introduction (p. 2).

Comments on the curricula of the ten schools

The first two questions deal with the characteristics of the curricula of the ten programmes. The study was undertaken without predetermined definitions of what constitutes community-oriented education or problem-based learning. Its aim was not to judge against some standard but to discover and describe what had developed. The elements characteristic of community-oriented education and problem-based learning did, in fact, repeatedly emerge and were then used as a way of describing the ten programmes singly and collectively. Moreover, finding that community-based education can be used as a means of achieving community-oriented education has served to dispel some of the confusion surrounding the terminology.

In the study it was found that the extent and type of community orientation achieved in practice by the ten schools could be effectively described by determining:

(1) the extent to which the school's guiding principles are community-oriented;

(2) the emphasis placed in the curriculum on concepts and knowledge of what constitutes a community and a population, how to measure and cope with health needs and how to take proper account of the cultural and social background;

(3) the extent to which community-based learning forms part of the curriculum;

(4) the degree of community involvement in the training programme;

(5) the organizational linkages between the school or programme and the health services system.

Four of the ten schools were found to have curricula that largely met all these criteria while a fifth school was going in that direction; five of the schools did not meet the criteria. While there is considerable variation, the five community-oriented schools are distinguished by the extent to which the decisions as to what, how, and where students are taught maximize the curriculum's ability to provide graduates with the knowledge, skills and sense of commitment needed if the health needs of the population are to be properly served. In particular, the community-oriented schools have created linkages with their environment. Unlike many medical schools, including some of the other five schools, these community-oriented schools are not isolated from the real world but part of it. Ideas move freely in both directions between the community-oriented schools and the society they serve. Those schools that are most highly community-oriented are not just *in* the community, but *of* the community.

Considerable evidence was found that there is a tendency towards increased linkages between the health service systems and the health manpower development systems in several of the countries where there are innovative schools. This had gone especially far in one school. The site visitor asked for two organizational charts, one for the health services and one for medical education but the integration of the two activities had become so close that only a single organizational chart for both of them was available.

While there have been notable successes in community-oriented education, it should not be assumed that community orientation is easy to achieve, or that the community-oriented schools are without serious problems. Of the five criteria for community orientation - its adoption as a principle, stress on it in the curriculum, com-

munity-based training, community involvement, and linkages with the health system - some have been met to a greater extent than others. For example, a school may adopt community orientation as a guiding principle, and the coursework may enable its students to learn about the community but difficulties often arise in moving from community-oriented to community-based learning, i.e., actually putting students in the community, involving the community and creating mutually beneficial links with the health system.

Questions of authority and responsibility arise. For instance, who should decide the form and purpose of the community-oriented education? Should the school decide? The community? The health system? Some combined body? Any of these answers raises difficulties. For example, if the school decides, is that community-oriented? It could be, in that the school might be in the best position to determine what the community needs. It easily could not be if the school in choosing takes the self-interest of the teaching staff as the primary basis for its choice.

On the other hand, it could be argued that the community should take decisions about what it needs, because it is only the community that knows what its members will accept. Yet in some cases community decisions were thought by the school's experts to conflict with the best ways of improving the community's health status. For instance, an example of the problems that might arise in the case of extensive links with the community was seen in one country where the health system was in such abysmal shape that complete linkage with it would probably have led to fewer rather than more of the school's graduates practising in their chosen or assigned posts. It is readily apparent, therefore, that the relationships between the school and the community and its health system are of an intensely political nature, whether it is a village of 200 inhabitants, a region of 200 000 inhabitants or the health system of the entire country that is concerned.

There are also logistical problems. No matter how committed a teacher may be to placing students in remote villages and going there to supervise, teach, and practise, being far away from the school itself takes additional energy and extensive amounts of time. There have been examples in which in the early stages of a programme, a high level of commitment to the concept of remote training impelled teaching staff to practise community-based education. As time went on, however, there were clear indications among the schools of a tendency to return to more campus-based programmes. Teachers in most community-oriented schools are scarce and overworked; they are torn between competing claims - to teach, to provide patient care, and to conduct research. Moreover, there were signs among the schools suggesting that as the programmes progressed, the reward structure of the school together with the teaching staff's concerns about its career prospects tended to force teachers to shift their priorities towards campus-based patient care and research activities and away from any form of teaching. The shift of emphasis away from teaching hit remote locations especially hard.

One feature revealed by the study was that the level of direct responsibility for the provision of health care services and teacher participation in it - both stated goals of community-oriented institutions - was considerably less than might have been expected. However, tertiary hospital experience for students ranged from 17 to 45% of all educational activities in the ten study schools which is a significantly higher level than in other schools. In the abstract, it is easy to see that the best approach to achieving community-oriented education is through a partnership between the school and the community and its health system, and by demonstrating the school's commitment through the presence of teaching staff in the field. Our observations made it clear, however, that such an approach is much easier to call for than to achieve.

It emerged from the analysis of the ten schools that if community-oriented education is to have an impact there must be effective arrangements for students to learn the skills and attitudes required from their periods of work in the community, since the settings in which they work as students are of vital importance in determining the nature of the education they receive. The shaping of a health worker through an educational process is less a matter of acquiring knowledge (although knowledge is certainly essential) than of integrating knowledge, skills, attitudes and beliefs into a sense of professional self. Such shaping is powerfully influenced in obvious and less obvious ways by the settings in which students are assigned to learn and by the role models provided by those who teach them in those settings. Students who are assigned to the hill country of Nepal, for example, may discover infestations of head lice and work out why one village has the problem while another nearby has not. The significance of community-based and guided experience is well illustrated by the following story from the Institute of Health Sciences in the Philippines.

> I went on one of my visits as an instructor to see the village where a young midwife was assigned. We walked together to the third mountain. It took us 2-1/2 hours to get there. I had to stop periodically because my heart is not good. As we walked, the student shared a concern that she held deep inside: "Mum, I had to deliver a baby here and it was a breech. The baby is okay, but the mother is numb in the legs and can't stand". I asked how she did it. "Mum, I just tried to think in my mind of where the coccyx and the other pelvic bones were and then I just pulled." We saw this woman together. The baby was fine but the mother's numbness remained. I told the mother she probably would be better in time and to take Vitamin B. Later, I asked the young midwife how things were. She reported that both mother and baby were fine now. "What else did you do?" I asked. "I just rubbed her legs, Mum. She's very grateful." This youngster of 19 was really practising medicine.

The importance of settings in the education process is just as great in developed countries, where the needs of both the affluent and the poor are frequently outside the experience of medical students. However, the students who observe and contemplate the meaning of death in a Navajo American Indian culture or those who share the gnawing anxiety of the alcoholic executive about his illness are experiencing community-oriented education just as much as the midwife in the mountains of Leyte. It is apparent, therefore, that more knowledge is needed about how to create and successfully maintain the essentials of community-based education.[1]

The study also looked at the adoption of various approaches to problem-based learning. It was found that in practical terms problem-based learning has been taken to mean one or more of the following:

(1) the use of selected problems as a basis for delimiting the content of the curriculum;

(2) assignment of an active role in the learning process to the students themselves;

(3) the division of students into small groups for learning purposes;

(4) the placing of emphasis on the learning process rather than content.

It was found in the study that problem-based learning played a significant role in five out of the ten schools. It is interesting to note that the five problem-based schools were found not to be significantly community-oriented and vice versa. However, the two groups seemed to be moving towards adopting some of each other's practices, i.e., the problem-based schools seemed to be moving towards adopting a more community-oriented approach and the community-oriented schools towards adopting a more problem-based curriculum. In addition, a number of the schools reported that the existence of the Network of Community-Oriented Educational Institutions for Health Sciences had been a factor in encouraging them to become more community-oriented and problem-based.

As for their contribution to community orientation, the problem-based approaches adopted by the schools studied seem to have done little in that direction. Indeed, problem-based education had largely been adopted with other ends in view, such as

---

1 For a more detailed analysis of community-based education see *Global Strategy for Health for All by the Year 2000.*, WHO, Geneva, 1981 ("Health for All" Series, No. 3), p. 23; and WHO Technical Report Series, No. 746, 1987 (*Community-based education of health personnel:* report of a WHO Study Group).

reducing the medical students' load, encouraging self-teaching skills and improving the teaching of clinical problem-solving. However, it was obvious from the study that if a school so wished problem-based approaches could probably be of considerable help in achieving the goals of community-oriented education. Even in traditional schools students' practical training is largely designed to enable them to cope with the most important health problems they will have to encounter when they have qualified and is the only time during their education when they come into direct contact with the sick.

In problem-based education the problems used as a basis for the curriculum determine not only what is to be learned but also where the learning is to be done, so that the students can acquire the skills and attitudes that will enable them to deal effectively with the problems they encounter in real-life settings, whether in the community, the clinic or the hospital. The choice of settings in which they will learn from practical experience how to solve the problems they are most likely to meet after graduation is thus of vital importance.

Similarly, experience gained in the community itself will be more useful if close attention is paid to selecting the settings in which the student will best learn how to cope with the community's specific health needs. Those needs will also be a determinant factor in devising the curriculum, i.e., choosing the fields of study most relevant to the community's problems. Thus careful selection of the problems to be studied and the settings in which the students will learn how to cope with them by practical experience is the basis both for problem-solving and for community orientation.

Comments on the impact of the ten schools

One of the purposes of the study was to collect objective and systematic data on the extent to which the schools, individually and collectively, have had an impact on health care through direct provision of health care services, the availability of health personnel, the quality of health care, the promotion of primary health care, the education of health personnel, and the production of graduates with characteristics consonant with the schools' innovative goals. In addition, data were collected on how the innovative school graduates compared with the graduates of other schools. It is not claimed that this study could adduce conclusive quantitative proof that the ten schools have had or have not had an impact on health status or even on the health systems of which they are a part. There is clear evidence, however, that the schools' efforts have had some very important consequences. All the schools reported that their teachers and students had provided health care. A majority of

schools reported an improvement in the quality of care in the communities that they served. Most of the schools reported that their work had resulted in increased numbers of health personnel being available. Policies related to primary health care have been influenced by the schools as has the availability of basic medical services. However, the schools seem to have had less influence in creating new public health programmes than might have been expected.

The schools have influenced the education and training of health personnel in other schools. Their graduates have exhibited characteristics consonant with school goals wherever an assessment has been made. Graduates of the innovative schools have compared favourably with the graduates of traditional schools. In general, there is sufficient evidence that the innovative schools are having an impact on health systems and on the education of health professionals to warrant a systematic longitudinal study.

To bring about changes in health systems through the education of health personnel is exceedingly difficult. Some leading staff interviewed in the course of this study suggested with hindsight that the goal may have been unattainable from the outset. Others remained convinced that it could be and was being achieved. The essential task is to find ways of linking educational programmes with the health systems and with the communities the systems serve. Much has been written about the conflicts between health-service systems and educational systems at the national level. Not enough, however, is known about how a specific school and a specific community can achieve workable linkages. More attention should be given, for example, to how students can be assigned to villages, how teachers can be best utilized for field supervision, how schools can create alternative health care programmes in collaboration with the community, and how agreements can be negotiated that share power and influence appropriately. Descriptive research at this level would be very useful in devising policies for achieving successful linkages between educational programmes and the communities they serve. Education might then have a greater impact on the health system and on meeting the health needs of people, however difficult it might be to distinguish that impact completely from that of the myriad political, economic, and social factors that will always be at work at the same time.

An issue of considerable interest is whether and in what form these innovative schools will survive. There has been scarcely any research to determine what factors contribute to or are essential for sustaining innovation in medical education, with the exception of that done by Bussigel et al. on the processes of reforming educational curricula in medical schools.[1] That research combined with practical experience and observation suggests that particularly important points are the extent to which (1) the innovative goals are understood and accepted by teaching staff, ad-

1 Bussigel, M. et al. *Innovation processes in medical schools.* New York, Praeger Publications, 1987.

ministrators, students and important bodies of opinion outside, (2) the organizational structure is suitable for attaining those goals, (3) the innovative goals complement other goals in the areas of patient care and research, (4) the institution's resource allocation is consistent with the innovative goals, (5) the long-term career goals of teachers and the goals of the school are compatible, (6) the reward system (salaries, status, security) for teaching staff is consistent with the innovative practices, (7) the successors of the original staff remain faithful to the original goals, and (8) systematic evaluation is carried out that provides the institution with information on progress towards achieving the goals set. Perhaps the schools can best predict their future by considering how far they meet such criteria.

Conclusions

(1) There is a need for coordinated, comprehensive, objective and long-term evaluation of each programme and of the whole group of programmes to help sustain, promote and improve the development of community-oriented education.

(2) Major efforts should be made to train a core of leading staff from the whole group from which member schools can recruit first-generation and second-generation leaders.

(3) Sound, scholarly programmes of research on how to achieve the fundamental purposes of community-oriented education need to be developed by the schools.

(4) More attention must be given to the nature and extent of the linkages between the educational programmes and the community in general and the health care system in particular.

(5) Schools should develop further the direct provision of services exemplifying the kind of work they expect of their graduates in the types of setting in which they are expected to work.

(6) The community and all its health facilities should be used much more extensively and consistently as a learning environment throughout the whole curriculum.

(7) If problem-based learning is to be a means of achieving community-oriented education of health personnel, more attention must be given to the selection of high-priority health problems as the basis for curriculum development.

One finding seems to stand out from the rest in importance. A great diversity of approaches to medical education is possible without sacrificing "quality", in spite of the incessant asseverations of the establishment to the contrary. At the same time, it is one of the challenging responsibilities of innovative schools to subject to searching analysis the very definition of what makes up *quality* medical education and health care. This point is made succinctly by Dickinson of the Institute of Medicine in Nepal:

> Students often ask me, "Will we be as good as doctors in the West?" This takes me back to my original question: What *is* a doctor? Moreover, what is a *good* doctor. The graduate of a London teaching hospital in a developed country is doubtless superior in ordering and analysing a wide range of tests, but how would he/she manage a rural hospital in Nepal? I have no hesitation in telling my students that, for Nepal, they will become not only as good as Western doctors but immensely better.[1]

A point that is self-evident but frequently ignored is that if community-oriented medical education is to be achieved it is essential that no school accept *apriori* somebody else's definition of a good doctor or a good medical education. Indeed, the quality of medical education depends to a considerable extent on its relevance to the health needs of the community served.

Some of the schools covered by this study, in spite of the odds against them, have reached out beyond the roads to the villages in the hills or on the other side of the mountain, to the families who struggle to survive amidst the rubble of urban slums. The goal of health for all by the year 2000 is fundamentally a moral imperative. To create programmes that answer a moral imperative requires moral judgement and commitment, in this case a commitment to the fundamental right of all human beings to health. Much has been achieved but much more remains to be done.

---

1 For a more detailed analysis of community-based education see *Global Strategy for Health for All by the Year 2000*, WHO, Geneva, 1981 ("Health for All" Series, no. 3) , p 23; and WHO Technical Report Series, No 746, 1987 (Community-based education of health personnel: report of a WHO Study Group).

ANNEXES

Annex 1

QUESTIONNAIRE

CENTER FOR EDUCATIONAL DEVELOPMENT
SURVEY OF INNOVATIVE
HEALTH PERSONNEL PROGRAMMES

Medical school _____

Dean _____

Year medical school founded _____

Form completed by _____

Title or position _____

Date _____

I. GOALS

1. Does your school have a formal statement of goals? ___ Yes ___ No
   If yes, please provide a copy.
2. If no formal statement of goals exists, please describe the goals of your school briefly in your own words.

_____

_____

_____

3. Did governmental bodies or government officials heavily influence the goals of the school? ___ Yes ___ No
4. How much agreement is there about these goals?

_____

_____

_____

5. It is sometimes the case that original goals change for many reasons as an educational programme is actually planned and then implemented. Money may be too limited; staff cannot be recruited; the staff that are recruited may not believe in the goals; communities may not be supportive; students may resist; managerial inefficiencies may limit success, etc. Please discuss which of the original goals of your school have changed, and why.

_____

_____

_____

_____

_____

_____

_____

6. Regarding the goals of your school, which statement below is most accurate?

___ They were almost exclusively created by the Dean.

___ They were created by the Dean advised by a small group of influential members of the teaching staff.

___ They were created by the Dean and the teaching staff in collaboration.

___ They were more the creations of the teaching staff than of the Dean.

7. Name the *four most important characteristics* you hope to develop in your students and give *the most important method used* to try to do this.

Student characteristic	**Method used**
a. _____	a. _____
	_____
	_____
b. _____	b. _____
	_____
	_____
c. _____	c. _____
	_____
	_____
d. _____	d. _____
	_____
	_____

8. In what ways would you expect your graduating students to be different from graduates of conventional medical schools?

_____

_____

_____

II. CURRICULUM

Please enclose a copy of a written description of your curriculum. This may be in the form of a catalogue for students, a more lengthy description of courses, sequences of courses, etc., or a brief chart showing the schedule of student courses for each year.

9. Do you consider your curriculum to be community-oriented?

____ Entirely ____ Partially ____ Not at all

10. If "partially", what part is community-oriented? (e.g. a course, a track in the preclinical period, interspersed throughout the six years, etc.)

_____

_____

11. If your curriculum was intentionally designed or redesigned to assure an education emphasizing the following, please indicate the year or years in which it is included. If it is not included, please tick "no".

	Years						
	No	1	2	3	4	5	6
Major health problems of your country							
Major diseases of your country							
Major diseases not common in your country							
Epidemiology of health problems/diseases							
Techniques of health education							

	Years					
	No	1	2	3	4	5	6
Food and nutrition							
Safe water supply							
Water-borne diseases							
Sanitation							
Maternal and child health							
Family planning							
Immunization							
Prevention of endemic diseases							
Other (please specify)							

12. Please indicate where the emphasis in your curriculum falls on the continua below. Place an "X" anywhere on the line. The dashed line marks the central spot, meaning equal distribution of the two items.

Health maintenance/ improvement	Disease-oriented acute/chronic care
Primary health care	Tertiary care
Treatment at home	Hospital care
Hospital care	Community clinic care
Community clinic	Home health visits
Rural health problems	Urban health problems

Physical/biomedical science	Behavioural science
Health of population or community	Individual care

13. Do your students participate in the following activities as part of their medical education? If yes, indicate the year(s) in which they are carried out. If an activity is not included, check "no".

	Years						
	No	1	2	3	4	5	6	Other
Attend lectures on epidemiology								
Make home visits								
Talk with community leaders								
Do epidemiological studies								
Work in a hospital								
Meet with families in rural areas								
Meet with families in urban areas								
Work in community health clinics								
Work with students in other professional areas (e.g., education, agriculture)								
Work with other health professionals								

14. Is the community work of your students specifically evaluated?

____ Yes ____ No ____ Partially

15. If "yes" or "partially", please describe how below.

16. Please make additional comments you may have about the community-oriented portion of your curriculum (e.g., structure of the curriculum, implementation and administration, receptivity of students and teachers, prospects for future directions, etc.).

_____

_____

_____

17. Indicate the model for acquisition (and presentation) of knowledge predominantly followed in the organization of your curriculum.

____ Organ system ____ Discipline ____ Problem-based

Other (please specify): _____

18. If your curriculum is problem-based, indicate the extent.

____ Entirely ____ Partially

19. If problems are used in your curriculum, please give the basis (one or more) for selecting the particular problems that are used.

_____

_____

_____

20. Please tick each statement that describes a problem-solving approach used in your curriculum.

	Pre-clinical years	Clinical years	Not used
a. Lecturers use problems to illustrate the application of their material			
b. Students learn to gather and organize patient data (e.g., history, physical, laboratory), using a problem-solving approach			

	Pre-clinical years	Clinical years	Not used
c. Students are presented with problems to which they apply information learned in other ways			
d. Students do problem-solving exercises outside regular class time			
e. Problems serve as the basis for the acquisition of an integrated body of knowledge and determine the amount of factual knowledge learned			
f. Other:			

21. Of the statements in Item 20, circle the letter (below) that *best* describes the problem-based portion of your curriculum.

    Pre-clinical: a. b. c. d. e. f.

    Clinical: a. b. c. d. e. f.

22. Indicate the primary (P) and secondary (S) teaching methods used in each year of your curriculum by placing a "P" or an "S" in the appropriate spaces.

	Year					
	1	2	3	4	5	6
Lecture						
Small-group discussion						
Small-group tutorial						
Laboratory group						
Field work						
Self-directed						
Other (please specify)						

23. Place an "X" in front of the statement that most closely describes the principles underlying your curriculum.

    ___ There is a finite, definable body of knowledge that all medical students must acquire to become competent physicians.

    ___ It is not possible to define a body of knowledge that all medical students must acquire because competent physicians use different bodies of knowledge.

24. Please make any additional comments you may have about the problem-solving part of your curriculum (e.g., curricular structure, implementation and administration, receptivity of students and teachers, prospects for the future, etc.).

    _____

    _____

    _____

III. OUTCOMES

The goals of your school and those of other schools in this study will take many years to attain. It is probably too early to determine conclusively the extent to which the school has improved health care directly or through your graduates. Yet it can be extremely beneficial to all schools like yours that share in a common cause to get an indication of progress and evidence of achievements.

A. CHARACTERISTICS OF MEDICAL SCHOOL GRADUATES

25. Please provide the following information on your school.

    Total number of graduates: ____
    Year first class accepted: ____
    Number of classes that have graduated: ____

26. Please provide the following information on classes that have graduated in the past *three* years. If this information is not available, provide information covering either two years or one year and indicate which.

___ Three ___ Two ___ One

% going on to further training: ___
% now in practice: ___
Number of graduates practising in rural areas: ___
Rural is defined as: _____

_____

_____

Number of graduates practising in urban areas: ___
Urban is defined as: _____

_____

_____

27. Is there a government policy requiring graduates to practise in specific areas for a period of time?

___ Yes ___ No

28. If yes, please explain: _____

_____

29. Of the most recent class of graduates who are taking further training, please indicate the numbers in each of the following areas:

___ internal medicine
___ surgery
___ public health
___ obstetrics/gynaecology
___ basic sciences (physiology, biochemistry, pharmacology, etc.)
___ paediatrics
___ family practice/general medicine
___ other: please specify

_____

One way to assess outcomes of an educational programme is to compare the graduates with those of other schools. For innovative schools this can be a problem. Usually, for example, a standard examination for licensure or other purposes measures traditional medical education but does not measure the special objectives of innovative approaches. None the less, comparisons between your school and others in your area can provide useful data. If reports have been written that pertain to these questions, please provide them or list a source for your figures.

30. Are students or graduates of medical schools in your country required to pass a common examination?

___ Yes ___ No

31. If yes, please provide data on how your students have performed compared with those of other schools.

Name of test: _____

	Your students' scores		All students	
	Mean	S.D.	Mean	S.D.
Overall score	_____		_____	
Subscores (please list):				
_____	_____		_____	
_____	_____		_____	
_____	_____		_____	

32. Has your school attempted to compare its students systematically with those of one or more other schools in the country or area?

___ Yes ___ No

If no, please go to question 35.

33. If yes, please tick on which of the following you compared your students with others.

___ basic scientific knowledge
___ clinical knowledge
___ skill as a self-learner
___ attitudes toward medical practice

___ attitudes toward patients
___ attitudes toward other health personnel
___ ability to work as a member of a health team
___ attitudes toward community health needs
___ other (please specify): _____

34. For each of the items ticked in question 33, report your findings below. If you have written documentation, please include it when the survey is returned.

_____

_____

_____

_____

_____

35. If your country has more than one medical school, what percentage of all medical school graduates of the last three years practise:

in rural areas? ____ in urban areas? ____

Define rural and urban as on page 8

Source: _____

36. What percentage of the physicians in your country practise:

in rural areas? ____ in urban areas? ____

Source: _____

37. What percentage of the physicians in your country are in general practice (called family practice in some places)? _____

Source: _____

B. IMPACT ON HEALTH CARE DELIVERY

Medical schools seek to bring about improvements in the health care system indirectly through the eventual practice of their graduates. Medical schools can also have a more direct influence on the availability of care and the types of care provided. This section of the survey seeks to determine what the direct influences of your medical school have been on the health care system. Please include ways in which you believe your medical school has influenced health care in your area. If there are any objective data (research studies, government reports, etc.) that pertain to these questions, please cite or enclose a copy.

	Very substantial	Substantial	Somewhat	Not at all	Not a problem
38. Increased availability of physicians					
What evidence do you have?					
39. Increased availability of general practitioners					
What evidence do you have?					
40. Increased availability of nurses					
What evidence do you have?					
41. Increased availability of other primary health workers					
What evidence do you have?					

	Very substantial	Substantial	Somewhat	Not at all	Not a problem
42. Reduced malnutrition in the surrounding population					
What evidence do you have?					
43. Influence on health policies towards primary health care					
What evidence do you have?					
44. Increased availability of safe drinking-water					
What evidence do you have?					
45. Improved maternal and child health					
What evidence do you have?					
46. Increased attention to health education for the public					
What evidence do you have?					

	Very substantial	Substantial	Somewhat	Not at all	Not a problem
47. Increased availability of basic medical services					
What evidence do you have?					
48. Improved quality of care provided in local hospitals					
What evidence do you have?					
49. Improved medical practice by community physicians					
What evidence do you have?					
50. Increased availability of specialized care					
What evidence do you have?					
51. Institution of new public health measures					
What evidence do you have?					
Other (please specify):					
.....					
What evidence do you have?					

C. IMPACT ON HEALTH EDUCATION

In some instances a medical school can have an influence on government policies with regard to health or health manpower training. In other cases a school may have an influence on other medical schools. Please state in which of the following ways your school has influenced health education. Again, if there are any objective data on this, please either cite or include them.

	Very substantial influence	Substantial influence	Some influence	No influence
52. Way in which government funds medical schools				
What evidence do you have?				
If school has had an influence, briefly describe its nature				
53. Way in which new schools are mandated by government to conduct medical education				
What evidence do you have?				
If school has had an influence, briefly describe its nature				
54. Licensure of physicians				
What evidence do you have?				
If school has had an influence, briefly describe its nature				

	Very substantial influence	Substantial influence	Some influence	No influence
55. Accreditation practices				
What evidence do you have?				
If school has had an influence, briefly describe its nature				
56. Laws governing promotion, tenure, and governance of teaching staff				
What evidence do you have?				
If school has had an influence, briefly describe its nature				
57. Acceptance by other schools of some aspect of your school's approach				
What evidence do you have?				
If school has had an influence, briefly describe its nature				
58. Other (please specify):				
What evidence do you have?				

D. HEALTH CARE ACTIVITIES

59. Does your school operate a hospital? ___ Yes ___ No

    If yes, how many beds does it have? _____

60. Do one or more hospitals in the area depend upon the physicians teaching in your institution to provide patient care? ___ Yes ___ No

61. Does your school operate primary care clinics or in other ways provide basic medical services? ___ Yes ___ No

    If yes, please describe those services briefly, including the number of people served and in what ways.

    _____

    _____

    _____

62. Does your school conduct health education programmes for the community or in other ways serve the health needs of people? ___ Yes ___ No

    If yes, please describe briefly.

    _____

    _____

IV. ORGANIZATIONAL CHARACTER OF SCHOOL

63. Please supply the following information for each of the major (standing) committees of your school. In addition, please provide an organizational chart (table of organization) for your school and your by-laws or other formal rules of governance and return with this survey.

Committee	Responsibilities	No. of members	Are members elected or appointed?	Is membership departmentally based?
_____	_____	_____	_____	_____
	_____			
_____	_____	_____	_____	_____
	_____			

Committee	Responsibilities	No. of members	Are members elected or appointed?	Is membership departmentally based?

64. What organizational units have responsibility for teaching? (departments, interdepartmental groups, Dean's office, or other)

65. Who controls the budget for the teaching programme?

66. Trace the path of a curricular change through the school's decision-making structure. List all sites where the change must be approved.

67. Which individual or group is most influential in taking decisions on the curriculum?

V. EVALUATION SYSTEMS

68. Are any of the following methods used for formal evaluation of the students?

___ True-false tests
___ Multiple choice
___ Short answer
___ Matching
___ Essay
___ Written simulation
___ Simulated patient
___ Other (please specify):

___ Oral examination
___ Checklist/rating scale
Filled in by:
__ teaching staff
__ student (self)
__ peers
__ patients

_____

_____

69. Tick each student performance (listed below) that is evaluated.

___ Knowledge (basic science)
___ Knowledge (clinical)
___ Knowledge (community health)
___ Laboratory skills
___ Clinicals skills
___ Interaction with patient (communication skills)
___ Interaction with other health professionals
___ Interaction with the patient's family
___ Teamwork
___ Problem-solving
___ Clinical reasoning
___ Patient education
___ Community project
___ Attitudes
___ Values

Please list examples of the attitudes, values and beliefs that your school evaluates.

_____

_____

Other aspects of your students that are evaluated (please specify).

_____

_____

70. If your school has a formal orientation programme for new students, please describe it briefly.

_____

_____

71. Please describe briefly the system you have developed to evaluate the long-term achievement of the goals of your school's approach to educating health personnel. Enclose any written materials you may have on your system for evaluating the outcomes of the programme.

_____

_____

_____

72. Please give any other information that would be helpful in understanding your student evaluation system.

_____

_____

_____

VI. INFLUENCE OF EXTERNAL FORCES

73. What other medical schools exist in your country or in neighbouring countries that your students would regard as an acceptable alternative to attending your medical school? In what year were they established and how would you describe their curriculum (i.e., conventional or innovative)?

			Curriculum (tick one)	
Medical school	Location	Year started	Conventional	Innovative
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

74. How are students selected for admission to the available medical schools?

___ Government assigns students to medical schools.
___ A national lottery is held.
___ Each medical school makes its own decisions.
___ Other (please specify): _____

75. Does your medical school engage in any activities to attract new students?

___ No.
___ Yes, offers financial incentives.
___ Yes, distributes promotional literature.
___ Yes, offers better working/studying conditions.
___ Yes, offers job guarantees upon completion.
___ Other (please specify): _____

76. Funding: For all aspects of your school, what is your principal source of funds?

___ State funds allocated to education

___ Tuition

___ Income from health care delivery

___ Research support funds

___ Other (please specify): _____

77. Where are decisions concerning the recruitment of new teaching staff made?

___ Within the medical school ___ Outside the medical school

78. If decisions concerning the employment of new teaching staff are made outside the medical school, what agencies are involved in the decision?

_____

_____

_____

79. Does your medical school engage in any activities designed to attract teaching staff?

___ No

___ Yes, offers higher than average salaries

___ Yes, offers better working conditions

___ Yes, offers more opportunity to do research

___ Yes, offers more autonomy

___ Yes, offers more job security than most medical schools

___ Yes, offers more opportunities for development of teaching staff

___ Yes, offers more opportunity for teaching staff to travel

___ Other (please specify): _____

80. Does your school have a *formal* orientation programme for new teaching staff members?

___ Yes ___ No

If yes, please describe briefly and/or attach descriptive materials.

_____

_____

81. To what extent are the following used as criteria for promotion of teaching staff?

	Very substantial	Substantial	Some	Not at all
Clinical or biomedical research				
Clinical patient care service				
Performance as a teacher				
Planning or coordinating of educational programmes				

82. Have there been any significant changes in the criteria for promoting teaching staff at your school since its establishment? ___ Yes ___ No

If "yes", please describe briefly: _____

_____

_____

83. Do the factors considered for teacher promotion at your school differ substantially from those considered at other schools in your country?

___ Yes ___ No

If "yes", please describe briefly: _____

_____

_____

84. Where does the power to license physicians reside?

___ State/national legislature

___ State/national administration

___ university

___ professional association

___ other (please specify): _____

85. Does a national association of physicians exist? ___ Yes ___ No

86. What are its major functions?

_____

_____

_____

87. What are the requirements for membership?

_____

_____

_____

88. What percentage of physicians are members of the association? ___%

89. Describe the processes for appointment of members of physician licensing bodies.

_____

_____

_____

_____

90. Which of the following areas are subject to government regulation?

___ medical school curricula

___ admissions policies

___ time allocated to teaching

___ time allocated to research

___ time allocated to health care delivery

___ kinds of health care delivery systems in which the medical school is involved

___ promotion of teaching staff

CHECKLIST

Throughout this questionnaire, you have been asked to supply copies of various reports, numerical data and written descriptions that will be helpful to this survey. Please tick those you have been able to provide.

___ Statement of your school's goals

___ Description of your curriculum

___ Orientation programme for new students

___ Description of student evaluation methods and criteria

___ Data on where recent graduates practise

___ Comparative data for graduates of other medical schools in your country

___ Organization chart and by-laws of your school

___ Reports on impact of health care delivery and education

___ Orientation of programme for new members of teaching staff

___ Description of how programme outcomes are evaluated

Annex 2

SPECIFIC FINDINGS FOR EACH OUTCOME CATEGORY

Table A2.1 Impact of innovative schools on the quality of health care services

School/ Programme	Influence on:		Evidence
	Quality of care in local hospitals	Medical practice by community physicians	
A	Very substantial		Only hospital in region changed from poorly managed community hospital to better managed university hospital
		Very substantial	Over 100 M.D.s attracted to area since opening of school; about 50 medical graduates did field work in primary care for at least a year each; number of residencies in family medicine increased from 9 to 35 over 5 years; most residents will practise in the area; programmes in primary paediatrics and primary internal medicine are beginning
B	Appears substantial	Data not available	(Absence of survey for exact categories of data)
C	Substantial		Teaching hospital
		Not indicated	Generalist training programme
D	Some		Regional health data
		Some	Quality of consultations (estimated)
E	Some	Some	School's testimony
F	Some	Substantial	Regional health and research projects Statement of government, 1984
G	None	None	
H	Some		Anecdotal evidence to suggest that speciality-based services, particularly in paediatrics, obstetrics and gynaecology, and to a lesser extent, immunology, have improved
		None	
I	Data not available		
J	Very substantial		Medical officers now in all local hospitals
		Some	Community physicians now practising

Table A2.2 Impact of innovative schools on availability of health care personnel

School/ Programme	Influence on increased availability of:					Evidence
	Physicians	General practitioners	Nurses	Other primary health workers	Specialized care	
A	Very substantial	Very substantial				Over 100 M.Ds attracted to area since opening of school; about 50 medical graduates did field work in primary care for at least a year each; residencies in family medicine increased from 9 to 35 over 5 years
			Substantial			Retraining of rural nurses to function independently; opening of a nursing school with a 4-year B.A. course in community nursing
				Some		Programme for training clinic managers begun; community and rural nurses as above
					Very substantial	Influx of many new specialists and increase in inpatient and outpatient hospital facilities; specialists travelling to community; establishment of paediatric and newborn intensive care
B	Data not available	Data not available				(12 medical students just graduated in 1985 assigned to district hospitals)
			Appears very substantial[a]	Appears very substantial[a]		102 village health workers, 244 community health workers, 54 community health nurses, 57 B.S. degrees in community health; graduates in nursing and midwifery considered "model" health workers and widely utilized by Ministry of Health
					Data not available	
C	Some	Some				Generalist training programme
			Very substantial			School runs 3 auxiliary nurse-midwife schools – 2 certificate programmes and one post-basic programme

				Very substantial		School trains health assistants, ayurvedic assistants and community medicine auxiliaries
					Substantial	Teaching hospital
D	Some	Some	Some	Not a problem	Some	National manpower data
E	Substantial	Substantial				Presence of graduates in area; programme's presence attracted other practitioners; establishment of two primary care clinics by programme which care for 20 000 people
			None	None	Some	National manpower data
F	Not a problem	Not a problem	Not a problem	Not a problem	Some	
G		Data not available			Not a problem	High M.D./population ratio (1/700)
H	Not a problem	None	None	None	Some	Anecdotal evidence to suggest speciality-based services, particularly in paediatrics, obstetrics and gynaecology, and to a lesser extent, immunology, have improved
I		Data not available				
J	Very substantial					Before the school was established there were fewer doctors and all were trained outside the country
		Very substantial				Most doctors trained are posted as general practitioners
			None	Some		Doctors run health worker education courses – "village health workers"
					Very substantial	University staff provide specialized care

[a] Survey not available.

Table A2.3 Impact of innovative schools on primary health care initiatives

School/ Programme	Impact on: Reduction of malnutrition	Availability of safe drinking-water	Health education for the public	New public health measures	Shift in health policies towards primary health care	Maternal and child health	Availability of basic medical services	Other	Evidence
A	Some								In at-risk target population (50 000 of 300 000) use of mobile clinic to re-educate young mothers in using cows' milk, treating diarrhoea and using proper feeding practices
		Not a problem							
			Substantial						Health education unit (supported by national health insurance/service) with community health education programmes; student-initiated programmes for health projects for entire communities
				Some					Oral rehydration in newborn
					Very substantial				There is a joint committee on policy, headed by the Dean, who is also Regional Services Director
						Substantial			Establishing primary care paediatrics residency track; residents from senior year work in community
							Some		Mobile unit established; existing services improved

B	Appears very substantial; no survey giving exact data on categories					Appears substantial	Graduates (community and village health workers, nurses, midwives, doctors) work in a variety of primary health care activities in community at various stages of training
					Appears very significant		In collaboration with Ministry of Health, developed monitoring systems in rural areas and influenced M.O.H. formulation of national policies and strategies for primary health care and integration of public health and hospital services in rural areas
						Appears very substantial	Graduates (midwives, nurses, community health workers, etc.) engage in MCH activities
C	Data not available	Data not available					Developed own water system for school campus
			Some	Data not available			Health education programme conducted by school's teaching staff during field practice of students
					Substantial		
						Data not available	Through training of auxiliary nursing midwives who provide MCH services
						Substantial	Major health post (of university)
D	Not a problem						National health survey
		Not a problem	Some	Some			Nothing specific
					Some		Provincial task force reports
						Not a problem	
						Not a problem	

Table A2.3 (*continued*)

School/ Programme	Impact on: Reduction of malnutrition	Availability of safe drinking-water	Health education for the public	New public health measures	Shift in health policies towards primary health care	Maternal and child health	Availability of basic medical services	Other	Evidence
E	Not a problem	Not a problem	Some	Not a problem					No data cited in survey
					Some	Not a problem			
							Substantial		Establishment of two primary care clinics
F	Not a problem	Not a problem							
			None						Although primary goal of social health faculty
				None					
					Substantial				Statement of government – 1984
						Not a problem	Not a problem		Regional health and research projects
								Some	Created an interface between hospital care and general practice called "Diagnostic Centre"

G	Some	Some	Some			Some		Report on rural health conditions in areas covered by school's graduates during last four years
				None				
					Some		Some	Special treatment by government health services towards school as a means of extending primary care
H	None	None	Some	None		None	Some	No data cited in survey
								Anecdotal evidence to suggest that speciality-based services, particularly in paediatrics, obstetrics and gynaecology, and to a lesser extent, immunology, have improved
I			Data not available					
J	Some							Nutrition education carried out in community
		Some						Village health workers trained by school's doctors undertake potable water projects
			Some					Health education activities by school's doctors
				Substan-tial				Creation of new health care centres and training of paramedical staff
					Substan-tial			
						Substan-tial		Doctors now staff MCH clinics
							Very sub-stantial	Doctors now in all areas

01765
EH1000
COMMUNITY HEALTH CELL
326, V Main, I Block
Koramangala
Bangalore-560034
India

Table A2.4 Impact of innovative schools on education of health professionals

School/ Programme	Influence on:							Nature of influence/evidence
	Funding of medical schools by government	Mandate of new medical schools	Licensure of physicians	Accreditation practices	Promotion, tenure and governance of teaching staff	Other schools	Other	
A	None	None	Some					Promoting the establishment of national licensing examinations/involvement in the decision-making process
				None				
					Some			Consideration of teaching performance for promotion usually based on student questionnaires/anecdotal and personal informal contacts; respondent in charge of teaching training workshops
						Substantial		Earlier clinical exposure, out-of-hospital educational experiences, teacher training/ verbal acknowledgement and perceptible changes in other schools' curricula
							Very substantial	Integration of hospital care, ambulatory care and community medicine into one establishment; overt acknowledgement
B	Data not available	Appears substantial[a]	Data not available	Data not available	Data not available	Appears substantial[a]		Influenced adoption of community orientation by other schools; ladder curriculum of international interest[a]
C	Some	Very substantial	Some	Not applicable and/or no data				No evidence cited

D	Some					Influence through a Regional Council of Faculties of Medicine
		None				
			Substantial			Recent move to review licensing procedure influenced by member of teaching staff who served as chairman
				Some		By obviously "being different" at each accreditation visit
					Very substantial	Specific guidelines for teaching staff
						Very substantial	International resource and model for innovation in medical education, especially problem-based learning[a]
E	None	Some				Law-making body now promotes school's community involvement
			None		None	
				Some		Substantial	Many of the country's medical schools have now adopted community-based policies, something that the innovative school pioneered with difficulty
F	Some					Government funds especially for progress in general practice; Dean negotiated with government
		Substantial				Teaching methods copied; school requested to give support
			None			Law governs physician licensure
				None		Task of Ministry of Health, medical sick funds and national association of physicians
					None	
						Substantial	Via Network in national and international activities

Table A2.4 (*continued*)

School/ Programme	Influence on: Funding of medical schools by government	Mandate of new medical schools	Licensure of physicians	Accreditation practices	Promotion, tenure and governance of teaching staff	Other schools	Other	Nature of influence/evidence
G	None	Some						Prominent participation in health services/universities' commission to upgrade medical education
			Not applicable	Not applicable	None	Some		Participation in meetings, seminars, workshops and providing consultants; formal relationships with 5 other medical schools both in and outside Network and country
H	None	None	None	None	None	Some		Other schools have made some attempts to liberalize their admission policies in line with those of the innovative school
I	Some							Within area of country where school is located
		None	None	None	None			
						Substantial		Number of consultations with new and established programmes at national and international level
J	Very substantial							First and only medical school and is completely government-funded
			Not applicable and/or no data					

[a] Data not available from survey.

Table A2.5 Residency training and practice location

School	Number of medical graduates	Proportion in further training/ residencies	Specialization[a]												Practice location
			Internal medicine	Surgery	Public health	Obstetrics/ Gynaecology	Basic sciences	Paediatrics	Family practice/ General medicine	Psychiatry	Ophthalmology	Cardiology	Undecided	Other	
A	176 (5 classes)	80% approx.	1	2		5		3	9 (31.0%)			2		7	Of last 3 years' graduates, those not in residency training are located in communities with $<10\,000$ pop.
B	12 (1 class, 1985)	0%													All assigned to district hospitals in province of origin for indefinite period under "social contract"
C	15 (1 class, 1985)	(must occur outside of country after 5 years' service)													All have 5 years "community service"
D	1070 (13 classes)	100%	23	10				10	36 (37.1%)				5	13	Of last 3 years' graduates, 6% in rural areas, 94% urban
E	37 (4 classes)	100%	7	3		3		1 last 3 classes	12 (44.4%)		1				Not available
F	175 (4 classes)	100%	5	4	8	2	13	1	38 (48.1%)	8					Not available

Table A2.5 (*continued*)

School	Number of medical graduates	Proportion in further training/ residencies	Specialization[a]											Practice location
			Internal medicine	Surgery	Public health	Obstetrics/ Gynaecology	Basic sciences	Paediatrics	Family practice/ General medicine	Psychiatry	Ophthalmology	Cardiology	Undecided	Other	
G	600 (10 classes)	50% approx.	6	13	6	2	4	2	7 (15.9%)	2				2	Of last 3 years' graduates not specializing, 14% in rural areas (<3 000 pop.), 86% in urban areas; school-generated survey of 1980 graduates indicated following work affiliation: Private 9 National health institutions 41 University or other educational institutions 5 (22 still in training, 77 respondents out of 141)
H	100 (2 classes)	100%	UNKNOWN												Not available
I	65 (4 classes)	100%	5	2				1	5 (27.18%)	4			1		Not available
J	400 (10 classes)	10% (rest general practitioners)	4	4			2	2	(0%)						10 years mandatory service, approximately 60% rural, 40% urban

WHO publications may be obtained, direct or through booksellers, from:

ALGERIA: Entreprise nationale du Livre (ENAL), 3 bd Zirout Youcef, ALGIERS

ARGENTINA: Carlos Hirsch, SRL, Florida 165, Galerías Güemes, Escritorio 453/465, BUENOS AIRES

AUSTRALIA: Hunter Publications, 58A Gipps Street, COLLINGWOOD, VIC 3066 — Australian Government Publishing Service *(Mail order sales)*, P.O. Box 84, CANBERRA A.C.T. 2601; *or over the counter from:* Australian Government Publishing Service Bookshops *at:* 70 Alinga Street, CANBERRA CITY A.C.T. 2600; 294 Adelaide Street, BRISBANE, Queensland 4000; 347 Swanston Street, MELBOURNE, VIC 3000; 309 Pitt Street, SYDNEY, N.S.W. 2000; Mt Newman House, 200 St. George's Terrace, PERTH, WA 6000; Industry House, 12 Pirie Street, ADELAID, SA 5000; 156–162 Macquarie Street, HOBART, TAS 7000 — R. Hill & Son Ltd., 608 St. Kilda Road, MELBOURNE, VIC 3004; Lawson House, 10–12 Clark Street, CROW'S NEST, NSW 2065

AUSTRIA: Gerold & Co., Graben 31, 1011 VIENNA I

BANGLADESH: The WHO Representative, G.P.O. Box 250, DHAKA 5

BELGIUM: *For books:* Office International de Librairie s.a., avenue Marnix 30, 1050 BRUSSELS. *For periodicals and subscriptions:* Office International des Périodiques, avenue Louise 485, 1050 BRUSSELS — *Subscriptions to World Health only:* Jean de Lannoy, 202 avenue du Roi, 1060 BRUSSELS

BHUTAN: *see* India, WHO Regional Office

BOTSWANA: Botsalo Books (Pty) Ltd., P.O. Box 1532, GABORONE

BRAZIL: Centro Latinoamericano de Informação em Ciencias de Saúde (BIREME), Organização Panamericana de Saúde, Sector de Publicações, C.P. 20381 - Rua Botucatu 862, 04023 SÃO PAULO, SP

BURMA: *see* India, WHO Regional Office

CANADA: Canadian Public Health Association, 1335 Carling Avenue, Suite 210, OTTAWA, Ont. K1Z 8N8. (Tel: (613) 725–3769. Telex: 21–053–3841)

CHINA: China National Publications Import & Export Corporation, P.O. Box 88, BEIJING (PEKING)

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA: *see* India, WHO Regional Office

DENMARK: Munksgaard Export and Subscription Service, Nørre Søgade 35, 1370 COPENHAGEN K (Tel: + 45 1 12 85 70)

FIJI: The WHO Representative, P.O. Box 113, SUVA

FINLAND: Akateeminen Kirjakauppa, Keskuskatu 2, 00101 HELSINKI 10

FRANCE: Librairie Arnette, 2 rue Casimir-Delavigne, 75006 PARIS

GERMAN DEMOCRATIC REPUBLIC: Buchhaus Leipzig, Postfach 140, 701 LEIPZIG

GERMANY FEDERAL REPUBLIC OF: Govi-Verlag GmbH, Ginnheimerstrasse 20, Postfach 5360, 6236 ESCHBORN — Buchhandlung Alexander Horn, Friedrichstrasse 39, Postfach 3340, 6200 WIESBADEN

GHANA: Fides Enterprises, P.O. Box 1628, ACCRA

GREECE: G.C. Eleftheroudakis S.A., Librairie internationale, rue Nikis 4, ATHENS (T. 126)

HONG KONG: Hong Kong Government Information Services, Beaconsfield House, 6th Floor, Queen's Road, Central, VICTORIA

HUNGARY: Kultura, P.O.B. 149, BUDAPEST 62

INDIA: WHO Regional Office for South-East Asia, World Health House, Indraprastha Estate, Mahatma Gandhi Road, NEW DELHI 110002

INDONESIA: P.T. Kalman Media Pusaka, Pusat Perdagangan Senen, Block 1, 4th Floor, P.O. Box 3433/Jkt, JAKARTA

IRAN (ISLAMIC REPUBLIC OF): Iran University Press, 85 Park Avenue, P.O. Box 54/551, TEHERAN

IRELAND: TDC Publishers, 12 North Frederick Street, DUBLIN 1 (Tel: 744835–749677)

ISRAEL: Heiliger & Co., 3 Nathan Strauss Street, JERUSALEM 94227

ITALY: Edizioni Minerva Medica, Corso Bramante 83–85, 10126 TURIN; Via Lamarmora 3, 20100 MILAN; Via Spallanzani 9, 00161 ROME

JAPAN: Maruzen Co. Ltd., P.O. Box 5050, TOKYO International, 100–31

JORDAN: Jordan Book Centre Co. Ltd., University Street, P.O. Box 301 (Al-Jubeiha), AMMAN

KUWAIT: The Kuwait Bookshops Co. Ltd., Thunayan Al-Ghanem Bldg, P.O. Box 2942, KUWAIT

LAO PEOPLE'S DEMOCRATIC REPUBLIC: The WHO Representative, P.O. Box 343, VIENTIANE

LUXEMBOURG: Librairie du Centre, 49 bd Royal, LUXEMBOURG

MALAWI: Malawi Book Service, P.O. Box 30044, Chichiti, BLANTYRE 3

A/1/87

WHO publications may be obtained, direct or through booksellers, from:

MALAYSIA: The WHO Representative, Room 1004, 10th Floor, Wisma Lim Foo Yong (formerly Fitzpatrick's Building), Jalan Raja Chulan, KUALA LUMPUR 05–10; P.O. Box 2550, KUALA LUMPUR 01–02; Parry's Book Center, 124–1 Jalan Tun Sambanthan, P.O. Box 10960, 50730 KUALA LUMPUR

MALDIVES: *See* India, WHO Regional Office

MEXICO: Librería Internacional, S.A. de C.V., Av. Sonora 206, 06100-MÉXICO, D.F.

MONGOLIA: *see* India, WHO Regional Office

MOROCCO: Editions La Porte, 281 avenue Mohammed V, RABAT

NEPAL: *see* India, WHO Regional Office

NETHERLANDS: Medical Books Europe BV, Noorderwal 38, 7241 BL LOCHEM

NEW ZEALAND: New Zealand Government Printing Office, Publishing Administration, Private Bag, WELLINGTON; Walter Street, WELLINGTON; World Trade Building, Cubacade, Cuba Street, WELLINGTON, *Government Bookshops at:* Hannaford Burton Building, Rutland Street, Private Bag, AUCKLAND; 159 Hereford Street, Private Bag, CHRISTCHURCH; Alexandra Street, P.O. Box 857, HAMILTON; T & G Building, Princes Street, P.O. Box 1104, DUNEDIN — R. Hill & Son Ltd, Ideal House, Cnr Gillies Avenue & Eden Street, Newmarket, AUCKLAND 1

NORWAY: Tanum — Karl Johan A.S., P.O. Box 1177, Sentrum, N-0107 OSLO 1

PAKISTAN: Mirza Book Agency, 65 Shahrah–E–Quaid–E–Azam, P.O. Box 729, LAHORE 3

PAPUA NEW GUINEA: The WHO Representative, P.O. Box 646, KONEDOBU

PHILIPPINES: World Health Organization, Regional Office for the Western Pacific, P.O. Box 2932, MANILA

PORTUGAL: Livraria Rodrigues, 186 Rua do Ouro, LISBON 2

REPUBLIC OF KOREA: The WHO Representative, Central P.O. Box 540, SEOUL

SINGAPORE: The WHO Representative, 144 Moulmein Road, SINGAPORE 1130; Newton P.O. Box 31, SINGAPORE 9122

SOUTH AFRICA: *Contact major book stores*

SPAIN: Ministerio de Sanidad y Consumo, Centro de publicaciones, Documentación y Biblioteca, Paseo del Prado 18, 28014 MADRID — Comercial Atheneum S.A., Consejo de Ciento 130–136, 08015 BARCELONA; General Moscardó 29, MADRID 20 — Librería Díaz de Santos, P.O. Box 6050, 28006 MADRID; Balmes 417 y 419, 08022 BARCELONA

SRI LANKA: *see* India, WHO Regional Office

SWEDEN: *For books:* Aktiebolaget C.E. Fritzes Kungl. Hovbokhandel, Regeringsgatan 12, 103 27 STOCKHOLM.
For periodicals: Wennergren-Williams AB, Box 30004, 104 25 STOCKHOLM

SWITZERLAND: Medizinischer Verlag Hans Huber, Länggassstrasse 76, 3012 BERN 9

THAILAND: *see* India, WHO Regional Office

UNITED KINGDOM: H.M. Stationery Office: 49 High Holborn, LONDON WC1V 6HB; 13a Castle Street, EDINBURGH EH2 3AR, 80 Chichester Street, BELFAST BT1 4JY; Brazennose Street, MANCHESTER M60 8AS; 258 Broad Street, BIRMINGHAM B1 2HE; Southey House, Wine Street, BRISTOL BS1 2BQ. *All mail orders should be sent to:* HMSO Publications Centre, 51 Nine Elms Lane, LONDON SW8 5DR

UNITED STATES OF AMERICA: *Copies of individual publications (not subscriptions):* WHO Publications Center USA, 49 Sheridan Avenue, ALBANY, NY 12210. *Subscription orders and correspondence concerning subscriptions should be addressed to the* World Health Organization, Distribution and Sales, 1211 GENEVA 27, Switzerland. *Publications are also available from the* United Nations Bookshop, NEW YORK, NY 10017 (*retail only*)

USSR: *For readers in the USSR requiring Russian editions:* Komsomolskij prospekt 18, Medicinskaja Kniga, MOSCOW — *For readers outside the USSR requiring Russian editions:* Kuzneckij most 18, Meždunarodnaja Kniga, MOSCOW G-200

VENEZUELA: Librería Medica Paris, Apartado 60.681, CARACAS 106

YUGOSLAVIA: Jugoslovenska Knjiga, Terazije 27/II, 11000 BELGRADE

Special terms for developing countries are obtainable on application to the WHO Representatives or WHO Regional Offices listed above or to the World Health Organization, Distribution and Sales Service, 1211 Geneva 27, Switzerland. Orders from countries where sales agents have not yet been appointed may also be sent to the Geneva address, but must be paid for in pounds sterling, US dollars, or Swiss francs. Unesco book coupons may also be used. Prices are subject to change without notice.

The Network of Community-Oriented Educational Institutions for Health Sciences groups together nineteen schools with innovative programmes for the training of health personnel. These schools are attempting to develop new approaches to health manpower training by making their courses more relevant to the community in which they are situated and using learning techniques based on problem-solving. The Network aims to help its member institutions in these regards, and also to provide assistance to other institutions in countries that have made a political decision to introduce innovations in the training of health personnel.

The World Health Organization and the Center for Educational Development in Chicago have collaborated in a study of ten schools that are members of the Network. This report examines the findings of the study, in particular the extent to which the schools have implemented community-oriented and problem-based education, and how the new approaches are affecting health care delivery, especially primary health care. The report will be of interest to all those involved in training health personnel.

Price: Sw. fr. 17.–

ISBN 92 4 170102 1